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THE COMMERCIAL FISHERIES OF ALASKA IN 1905

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By John N. Cobb

Assistant Agent at the Salmon Fisheries of Alaska

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INTRODUCTION.

The salmon and seal fisheries of Alaska constitute such conspicuous features of the fishing industry in that region that published reports have to a great extent neglected the other aquatic resources, and no complete compilation of statistics has ever been made. The Tenth (1880) and Eleventh (1890) censuses covered the ground partially, but the census agents had to deal with all phases of Alaskan endeavor and their reports upon the commercial fisheries were consequently not so complete as could be desired. The salmon fishery was treated by them in considerable detail, and has been canvassed and reported upon very fully by the Bureau of Fisheries.[a] The seal fishery has been the subject of investigation and legislation recorded in many volumes published by the Treasury Department, and more recently in the reports of the Department of Commerce and Labor. No special canvass of the other fisheries, however, has heretofore been made, the information published at varying periods by the Bureau of Fisheries being such as could be gathered by its agents at San Francisco in connection with their canvass of the Pacific coast states.

The data presented in the following pages for the year 1905 are the result of the writer's personal canvass of a portion of the region and the collection of reports from various fishing firms and officials of the government in Alaska. A history and recapitulation of results of the various fisheries is also given.

IMPORTANCE OF THE ALASKAN FISHERIES.

Long before the acquisition of Alaska was even dreamt of by our statesmen its wealth in fishery products was known, by hearsay at least, to the hardy mariners of the Pacific coast, as well as to the

[a] The salmon and salmon fisheries of Alaska. Report of the operations of the U. S. Fish Commission Steamer Albatross for the year ending June 30, 1898, by Jefferson F. Moser. Bulletin U. S. Fish Commission 1898, vol. XVIII, 1899, p. 1–178, pl. 1–63, charts A and B. Idem, 1900 and 1901, Bulletin 1901, vol. XXI, 1902, p. 173–398 and 299*–401*, pl. i–xliv, pl. A and charts A, B.

whalers from New Bedford, Mass., and other Atlantic ports, who frequented the waters of the north Pacific and Arctic oceans. In the memorial to the President of the United States adopted by the legislature of Washington Territory in the winter of 1866 especial stress was laid upon the fishery resources of the territory and the need for an arrangement with Russia by which our fishing vessels would be enabled to resort to the Alaskan harbors for shelter and to procure fuel, water, and provisions. Even at that time our fishermen were engaged in cod fishing on the Alaskan banks, the first vessel having gone there in 1863, while our whalers had been working in Bering Sea and along the Arctic shore for years.

The treaty of cession between Russia and the United States was signed March 30, 1867, ratified by the Senate May 28, and proclaimed by the President June 20 of the same year. Formal and actual possession was taken on the 16th of the following October. Much doubt was expressed in this country as to the wisdom of paying so large a sum of money for such an apparently sterile region as Alaska, and it was feared that the expenditure would never be justified. Such calculations were much at fault, however. The United States has not only been more than reimbursed directly, but through the fisheries alone has been many times compensated for the financial outlay. The rental from the fur-seal islands has more than paid the initial cost of the district, and at the present time the tax derived from the salmon fishery amounts to about $90,000 a year.

The following table shows, so far as it has been possible to secure reliable information, the quantity and value of fishery products secured in Alaskan waters from 1868 to 1905 (both inclusive). In some instances, where but rather fragmentary data could be obtained, estimates based upon the figures in hand have been inserted for the missing years. The second column in the table shows the products in units as put on the market, but in the third column all have been reduced to pounds for convenience in comparison. The dates given indicate the number of years the fishery in question has been prosecuted. No account has been taken in this table of the very extensive intertribal commerce of the natives in fishery products, as there are no accurate data for this feature.

QUANTITY AND VALUE OF THE FISHERY PRODUCTS OF ALASKA MARKETED IN STATED YEARS, 1868 TO 1905.

Species.	Quantity.	Prepared weight.	Value.
		Pounds.	
Codfish (1868–1905) ..... pounds..	156,125,684	116,511,629	$4,072,626
Halibut (1890–1905) ..... do....	37,999,506	29,630,373	921,562
Herring (1878–1905) ..... do....	10,365,877	7,793,885	202,492
Guano ..... do....	29,319,800	29,319,800	349,349
Oil ..... gallons..	4,281,420	32,110,650	1,055,368
Salmon (1868–1905) ..... pounds..	[a] 1,517,944,726	1,141,319,343	68,818,792
Sardines, canned (1904) ..... cases..	3,173	152,304	12,059
Trout (1904–5) ..... pounds..	55,382	44,306	2,307
Fish oil, other than herring (1890–1905) ..... gallons..	30,486	228,645	8,657
Fish guano, other than herring (1904–5) ..... pounds..	1,800	1,800	30
Clams, canned (1898–99, 1903–4) ..... cases..	1,137	54,576	4,440
Walrus ivory (1868–1905) ..... pounds..	843,930	843,930	343,542
Walrus oil (1868–1905) ..... gallons..	3,064,001	22,980,007	1,582,219
Whalebone (1868–1905) [b] ..... pounds..	246,166	246,166	567,417
Whale oil (1868–1905) [b] ..... gallons..	26,518	198,885	15,911
Beaver (1868–1905) ..... number..	150,683	150,683	752,011
Muskrat (1868–1905) ..... do....	251,225	31,403	13,123
Otter:			
Land (1868–1905) ..... do....	93,272	233,430	497,041
Sea (1868–1905) ..... do....	107,121	535,605	10,732,867
Seals:			
Fur (1868–1905) ..... do....	3,345,784	20,074,704	47,896,383
Hair (1868–1905) [b] ..... do....	191,042	573,126	194,442
Total	.....	1,403,035,250	138,042,638

[a] Includes 21,784,106 cases of canned salmon, with an estimated value of $3 per case.
[b] Estimated from data covering a portion of the period.

THE FISHING GROUNDS.

The district of Alaska is enormous in extent, being equal to nearly one-sixth of the United States proper. The total length of mainland from southeast to northwest is about 1,150 miles, the greatest width is about 800 miles, and the area is about 590,000 square miles. Because of the thousands of islands scattered along the coast, or, as in the case of the Aleutian chain, extending out to sea hundreds of miles, the district has an exceedingly long coast line and one well adapted to fishing, owing to the many large and safe bays, the sheltered channels between the islands and the mainland, and the numerous rivers which debouch from the mainland. The Nushagak River is to-day one of the important fishing streams of the world.

Following is a list of the fishing banks of importance off the Alaskan coast and in adjacent foreign waters so far as they have been discovered and charted. Notwithstanding the extensive fishing in this region, there are doubtless many fishing banks still unknown.

Fishing Banks in Alaska and Adjacent Foreign Waters.[a]

No. on chart	Name.	Locality.	Approximate position. Lat. N.	Approximate position. Long. W.	Approximate area.	Depth of water.	Kind of bottom.	Remarks (kind of fish, etc.).
			° ′	° ′	*Sq. miles.*	*Fathoms.*		
1	.....	Okhotsk Sea	54 00	[b]148 00	.....	.....	.....	Cod abundant; small halibut plentiful.
2	.....	Bering Sea	58 00	165 00	.....	.....	.....	Cod fairly abundant all over eastern part of sea as far out as 100-fathom line.
3	Slime Bank	.....do	55 00	164 00	1,445	20–50	Black sand and gravel.	Cod numerous; small halibut and red rockfish plentiful. Named from intermediate zone of jellyfish which cover fishing lines and bait with slime. Fishing good up to July 1. Slime too thick after that date.
4	Baird Bank	Bristol Bay	57 00	161 00	9,200	11–53	Gray sand, black sand, and gravel.	Cod numerous; small halibut and red rockfish plentiful. Best fishing ground about 20 miles off Port Moller.
5	Kulukak Ground	.....do	58 00	160 00	.....	12 25	.....do	Cod fairly numerous; small halibut and red rockfish also to be found.
6	Davidson Bank	South of Unimak Island	54 00	164 00	1,600	41–72	Gray sand, gravel, and broken shells.	Cod numerous; small halibut and red rockfish plentiful; also mackerel around Unalaska Island.
7	Sannak Bank	Southeast of Sannak Island	54 00	162 00	1,300	30–82	.....do	Cod numerous; small halibut and red rockfish plentiful.
8	Shumagin Bank	Southeast of Shumagin Islands	55 00	159 00	1,800	25–79	.....do	Do.
9	Albatross Bank	Southeast of Kadiak Island	57 00	152 00	3,700	27–90	.....do	Do.
10	Portlock Bank	Northeast of Kadiak Island	58 00	150 00	6,800	37–67	.....do	Do.
11	.....	Islands, coast of Alaska	56 00	134 00	.....	.....	.....	Halibut found all through southeastern Alaska; also herring in great quantities.
12	.....	Northwest of Queen Charlotte Islands.	54 00	133 00	.....	.....	.....	Best halibut grounds; fish as a rule larger than those caught farther south.
13	.....	Southwest of Queen Charlotte Islands.	52 00	132 00	.....	.....	.....	Good black cod and halibut grounds; halibut as a rule larger than those caught farther south.
14	.....	Southeast of Queen Charlotte Islands.	52 00	131 00	.....	.....	.....	Do.
15	.....	North of Queen Charlotte Islands.	55 00	133 00	.....	.....	.....	Good halibut grounds; halibut as a rule larger than those caught farther south.
26	.....	Off northern end of Graham Island.	54 10	132 30	600	25–40	Chiefly sand	Halibut; most abundant in the winter and fall months.
27	.....	.....do	54 00	131 40	150	4– 5	Sand	Halibut; fishing dangerous; shoals and bars not located on charts, and vessels exposed to gales from the eastward.
28	.....	Off banks, Goshen and Stephens islands.	53 30	130 30	.....	6–35	Sand, shells, and patches of rock.	Halibut abundant during the winter months.
29	.....	Around Gander Islands	52 35	129 25	.....	.....	.....	Halibut found in abundance.
30	Attu Mackerel Bank.	Around Attu Island	52 45	[b]173 00	.....	.....	.....	Mackerel inhabit this region in more or less quantities each year.
31	.....	Around Atka Island	52 05	174 30	.....	.....	.....	Mackerel.

[a] Reprinted from the pilot chart of the North Pacific Ocean for December, 1905.

[b] East.

THE COD FISHERY.

HISTORY.

The presence of cod along the Alaskan coast has been known for many years. The first mention was made by a Russian navigator in 1765, who reported "cod, perch, pilchards, smelts" as being found around the Fox Islands. Other navigators and explorers who reported the presence of cod were Cook (1786), Portlock (1787), Meares, Billings (1792), Langsdorf (1804), Sutke, and Sir George Simpson (1841), all of whom speak of it as being a very common fish. But little use was made of it, however, owing to the abundance of salmon. Early in the sixties American vessels from San Francisco discovered and fished on the cod banks in the Okhotsk Sea, the first American vessel to visit Alaskan waters apparently being the schooner *Alert*, which made a voyage to Bristol Bay in 1863. She secured but 9 tons of cod, however, the captain's principal incentive to make the trip probably being to trade with the natives.

On March 27, 1865, Captain Matthew Turner, with the schooner *Porpoise* (45 tons), of San Francisco, sailed for Alaska, and arrived at the Shumagin Islands May 1. The vessel returned on July 7 with 30 tons of cod, having left the banks early in order to get back to San Francisco before the Okhotsk fleet. This was the first fare ever taken from around the Shumagins, one of the best grounds in Alaska. The Simeonoff Bank was discovered by the *Minnie S. Atkins* in 1867.

The acquisition of Alaska by the United States in 1867 proved a boon to the cod fishermen, as it secured the Americans, who did all the fishing, from any interference on the part of the owners of Alaska. This is well shown by the fact that while the fleet in 1867 numbered 3 vessels, with a catch of 136,000 fish, the fleet of 1868 comprised 14 vessels, which made a catch of 608,000 fish.

It was early discovered that the time required for the vessels to reach the banks from San Francisco and return was wasted, and in 1876 T. W. McCollam & Co., which firm later merged into the Union Fish Company, one of the first to engage in the fishery on a large scale, established a permanent fishing station at Pirate Cove on Popoff Island, one of the Shumagin group. From this station fishermen in dories went out each day, returning in the evening with the day's catch. In this way fishing could be carried on the year through, and the plan was followed as time went on until now nearly all of the companies operating vessels in Alaska have one or more stations. Certain vessels are employed in carrying supplies to these stations from the home ports and in taking back the cod caught.

The first Alaskan vessel in the fishery was one owned by Captain Haley, of Wrangell, who in 1879 fished on the Hoochenoo Bank in Frederick Sound, and sold his catch in Wrangell for $100 per ton. The regular Bering Sea fishery was inaugurated by the *Tropic Bird* in 1883.

For years the fishery was followed by San Francisco firms only, but in 1891 Capt. J. A. Matheson, of Anacortes, Wash., brought the schooner *Lizzie Colby* (142 tons) around Cape Horn and sent her to Bering Sea, and he has continued in the fishery there ever since. The Western Canadian Fish Company, of Vancouver, British Columbia, sent a vessel to Bering Sea in 1903 and continued the venture until 1905, when the company failed. The Robinson Fisheries Company, of Anacortes, and the Seattle and Alaska Fish Company, of Seattle, sent their first vessels to Alaska in 1904. In 1905 King & Wing, of Seattle, and the Blom Codfish Company, of Tacoma, entered the fishery.

FISHING BANKS.

While most of the fishing banks were known to the fishermen in a general way, it remained for the steamer *Albatross* to survey and plat them during her investigations in Alaskan waters from 1888 to 1892.[a]

Following is a summarized description of the banks, first those in Bering Sea:

Slime Bank.—This is the first of the larger fishing grounds reached after entering Bering Sea through Unimak Pass. The bank begins directly off the Northwest Cape of Unimak Island, is elongate in shape, and follows approximately the trend of the adjacent coast to within a few miles of Amak Island, its inner margin lying only a short distance off the land. It is about 85 miles in length and 17 miles in average width, broadening somewhat at the eastern end; its total area is estimated at about 1,445 square miles, and the depths range from 20 to 50 fathoms. The bank derives its name from the presence of immense numbers of a large jelly-fish, measuring from 6 to 18 inches across the disk, and provided with long, slender tentacles having great stinging powers. These animals are not found upon the surface, but seem to occupy an intermediate zone toward the bottom, where at times they occasion much annoyance to the fishermen by becoming entangled with the fishing gear.

Baird or Moller Bank.—This is the largest bank yet discovered on the Alaskan coast. It commences a few miles east of Amak Island and extends northeastward off the northern side of the Alaska peninsula to the vicinity of Cape Chichago at the mouth of Ugaguk River, a distance of about 230 miles. It has an average width of about 40 miles and an extreme width of 58 miles, its total area being estimated at about 9,200 square miles. The boundaries have not been thoroughly established, and possibly comprise a greater area than is stated above.

In Kulukak Bay are numerous spots where cod are found, but none are of sufficient size to entitle them to be called banks.

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[a] Fishery investigations of the steamer *Albatross* from July 1, 1888, to July 1, 1892, by Richard Rathbun. Bull. U. S. Fish Com., 1892, p. 127–201.

Gravel Bank.—Fishermen sometimes visit this small bank, which lies about 16 miles southwest from the southern end of Hagemeister Island, and they state that large cod are abundant there. The depths are from 16 to 20 fathoms.

The *Albatross* investigations were not carried north of Cape Newenham. According to Petroff, in the Tenth Census, codfish have been reported at a few points along the Arctic coast, but no banks have been located, very likely because no effort has been made to find them.

Unalaska Harbor, etc.—Fishermen have reported cod banks in the neighborhood of Unalaska Harbor, but the investigations of the *Albatross* do not seem to sustain the claim. The cod fishing directly off Chernoffsky Bay is said to be excellent.

On the southern side of the Alaskan peninsula are the following banks:

Davidson Bank.—This bank was discovered about 1870 by Prof. George Davidson, of the United States Coast and Geodetic Survey, after whom it is named. It lies south of Unimak Island, and extends westward from the neighborhood of the Sannak Islands to about the longitude of the southern entrance to Unimak Pass (about longitude 164° 40′ W.). Its eastern end is continuous with the shoal water surrounding the Sannak Islands; its area was estimated at about 1,600 square miles.

Sannak Bank.—To the east and southeast of the islands of the same name lies Sannak Bank, somewhat elongate in shape and trending in a general way northeast and southwest. It is estimated to have an area of about 1,300 square miles.

The region between Sannak Bank and the Shumagin Islands was only partly surveyed, but about 1,800 square miles fairly well adapted to fishing were covered.

Shumagin Bank.—Lying to the south and southeast of the Shumagin Islands, with its outer margin following approximately the trend of the coast line formed by the adjacent islands, is Shumagin Bank, which has been traced westward to about longitude 159° 52′ W., but probably extends farther in that direction; east of the Shumagin Islands it reaches north to the latitude of Big Koniuji Island. Its width inside of the 100-fathom curve varies from 15 to 35 miles, while its area has been estimated at about 1,800 square miles.

From the Shumagin Islands to Kadiak Island the area was only partially surveyed, but the work done indicated the existence of several fishing banks.

Albatross Bank.—Off the southeastern side of Kadiak Island is Albatross Bank, extending the entire length of that island as well as in front of the Trinity Islands. At the eastern end it is practically continuous with Portlock Bank. Along some portions of the coast, as in the neighborhood of Sitkalidak Island, the bank is separated

from the land by comparatively deep water, while in other places shoal water intervenes. The 100-fathom curve is distant 25 to 45 miles from the land, inside of which limit there is an estimated area of 3,700 square miles.

Portlock Bank.—This bank extends northeastward from Kadiak Island in the direction of Middleton Island, a distance of about 120 miles, and is irregular in shape. It is the largest single bank south of the Alaska peninsula, its area inside of the 100-fathom curve being about 6,800 square miles.

The *Albatross* continued her investigations as far to the eastward as Middleton Island, but no banks were found.

Codfish have been reported in the western part of the Gulf of Alaska and in the waters of Southeast Alaska, but nowhere do there seem to be any banks which it would be profitable to work with vessels especially devoted to this fishery.

FISHING STATIONS.

At the present time nearly one-half of the codfish taken in Alaska are caught by fishermen from the numerous stations scattered along the Alaska peninsula and the islands adjacent thereto on the southern side. The business of fishing from stations has fluctuated considerably from year to year. The year 1892 was the banner year, 2,208,035 pounds of fish being taken by fishermen from stations, to 1,742,155 pounds secured by the fishing vessels. The stations soon after began to be abandoned, and for a few years but few were in operation. Of late years, however, they have regained their popularity, and it is probably only a question of a few years until all of the cod fishing outside of Bering Sea will be carried on from the shore stations. During the season of 1905 the following stations were operated.

Union Fish Company.—Pirate Cove, Popoff Island; Northwest Harbor, Big Koniuji Island; Sanborn Harbor, Wedge Cape, and Eagle Harbor, on Nagai Island; Pavlof Harbor and Johnsons Harbor, on Sannak Island.

Alaska Codfish Company.—Moffetts Cove and Companys Harbor, on Sannak Island; Dora Harbor, on Alaska peninsula; and Winchester and Banenhoff, on Unga Island.

Seattle-Alaska Fish Company.—Squaw Harbor, on Unga Island.

Aleutian Live Stock and Mining Company.—Lost Harbor, Akun Island.

This year (1906) the Pacific States Trading Company is erecting two stations on the Shumagin group.

Nearly all of these stations are open the whole year round, the fishermen going out in their dories each day when the weather is favorable, and but rarely having to go more than 5 miles from any of

the stations before good fishing grounds are reached. There is usually one man to a boat and trawl lines are quite generally employed, although a few hand lines are used. In good weather the trawls are hauled two or three times a day, but the fish are not dressed until the last haul for the day has been made.

When not out in the dories the fisherman's time is his own. He is paid from $25 to $30 per thousand fish of 26 or more inches in length, and he must dress and salt them. The wage is less for fish under 26 inches. The station owner furnishes the men with boats, lodging, food, and fuel, the fishermen providing only the fishing gear. The catch is kench cured, and later shipped away to San Francisco and Puget Sound ports on the transporting vessels, where the final curing is accomplished.

VESSEL FISHERIES.

Nearly all of the fleet fish in Bering Sea, where the banks are too far from the shore for shore fishing, or where harbors are not available.

With the exception of three vessels which use trawl lines, all fishing is with hand lines from dories, one man to a boat. The fishermen do not dress and salt their own catch, as is the custom on the Atlantic coast, but each vessel carries a dressing gang, varying with the number of fishermen, and a splitter and salter, who do this work. The captain usually receives about $125 per month; the cook, $75; the first mate, $40; the second mate, $35; the fishermen, $25 and $27 per 1,000 fish, according to the size; dressing gang, $25 per month each, and the splitter and salter, $75 per month. All hands get board also. When not engaged in their regular work the dressing gang usually fish over the side of the vessel and are paid $25 per 1,000 for all fish so caught. A vessel usually makes but one trip to the banks, leaving in the spring and returning in the late summer or early fall, but sometimes if she meets with good luck on her first trip she will make a second one. The fish are salted in bulk in the hold of the vessel, about 1 ton of salt being required for 1,000 fish, and the balance of the curing is done at the vessel's home port. The crew have nothing to do with unloading the vessel, that work being done by the employees at the home station.

The principal bait used in both shore and vessel fisheries is halibut, sculpins, and cuttlefish. In hand-lining only a small quantity of bait is brought on the vessels, because after the first few hours' fishing the shack fish brought up will suffice for baiting. For trawling, however, more bait is required, and the stations generally gather it at various places and furnish it to the fishermen either fresh or salted, as may be most convenient.

Certain of the vessels do nothing but ply between the stations and the home ports, bringing up supplies and carrying back the salted fish. These vessels make from three to four trips a year.

But few of the tongues, sounds, and livers of the cod are saved, either in shore or vessel fisheries.

STATISTICS.

The table below shows, by years, the condition of the fishery since its inception, in 1863. An interesting feature of this table is that while the average cured weight of a codfish was slightly over $2\frac{3}{4}$ pounds in 1868, in 1905 the average had risen to 4 pounds. This is due to the fact that the vessels now work largely on the outer banks, where the fish are larger than on the banks close to shore, which were the ones from which most of the fish came in the early days of the fishery. For some years the fishery was almost stationary, owing to the lack of an expanding market for Pacific cod, but during the past five years the demand has been quite heavy and has resulted in a considerable increase in the fleet and a corresponding increase in the catch.

VESSELS ENGAGED IN COD FISHING IN ALASKAN WATERS, TOGETHER WITH THE QUANTITY AND VALUE OF COD TAKEN, 1863 TO 1905.

Year.	Vessels.	Fish taken.	Salted weight.	Value.	Year.	Vessels.	Fish taken.	Salted weight.	Value.
			Pounds.					*Pounds.*	
1863 [a]	1	6,000	18,000	$2,340	1886	7	794,000	2,382,000	$83,370
1865 [b]	1	24,000	60,000	7,800	1887	6	795,000	2,385,000	71,550
1866	2	40,000	90,000	11,700	1888 [h]	6	735,000	2,386,000	59,847
1867	3	136,000	340,000	42,500	1889	4	520,000	1,560,000	39,150
1868	14	608,000	1,684,480	202,138	1890	4	771,580	2,314,740	57,868
1869	8	412,800	1,032,000	92,880	1891 [i]	8	1,188,000	3,751,711	93,793
1870	10	506,200	1,265,500	82,258	1892	6	1,312,000	3,936,000	118,080
1871	6	304,800	914,400	64,008	1893 [j]	6	1,216,000	3,648,000	109,440
1872	3	120,000	360,000	25,200	1894	5	894,000	2,682,000	80,460
1873	4	220,000	660,000	39,600	1895	6	847,637	2,542,910	76,290
1874	4	152,400	457,200	27,432	1896	9	728,000	2,184,000	76,440
1875	4	201,600	604,800	42,336	1897	10	1,065,000	3,195,000	127,800
1876 [c]	6	303,200	909,600	54,576	1898	10	817,000	2,451,000	122,550
1877	7	300,000	900,000	45,000	1899	11	1,377,000	5,508,000	206,550
1878 [d]	9	524,000	1,574,000	78,700	1900	10	1,565,725	6,067,000	218,550
1879	10	696,000	2,088,000	83,520	1901	10	1,504,000	6,016,000	180,480
1880 [e]	5	289,000	867,000	43,350	1902 [k]	12	2,248,000	8,992,000	269,760
1881	3	297,000	891,000	44,550	1903 [l]	13	2,177,000	8,708,000	261,240
1882 [f]	9	529,000	1,587,000	63,480	1904	16	2,742,111	11,064,944	261,316
1883 [g]	9	737,000	2,211,000	88,440	1905 [m]	21	3,030,836	12,123,344	303,084
1884	5	655,000	1,965,000	98,250					
1885	8	881,000	2,643,000	79,290	Total		34,270,889	117,019,629	4,136,966

[a] First vessel to fish for cod in Bristol Bay.
[b] Beginning of the Shumagin Islands fishing.
[c] Shore fishing station established at Pirate Cove.
[d] One vessel lost.
[e] Schooner Nagay lost in the spring.
[f] Schooners General Miller and H. L. Tiernan lost.
[g] Schooner Wild Gazelle lost.
[h] Schooner Isabel lost with 14 men.
[i] Schooner Dashing Wave lost.
[j] Schooner John Hancock lost.
[k] Schooner Anna lost with full cargo.
[l] Includes schooner Blakeley, of Vancouver, British Columbia; 2 Seattle (Wash.) firms began this year; schooner Mary and Ida lost with 78,000 fish.
[m] Schooner Pearl lost with 30 men; schooner Nellie Coleman lost with all on board.

THE HALIBUT FISHERY.

HISTORY.

The halibut is now one of the most extensively sought species in our commercial fisheries. For many years the Atlantic banks amply supplied the constantly growing demand, but ultimately these began to show the effects of the heavy drain upon them, and then the important eastern fishing companies began to turn their attention to the Pacific, where large banks had been reported.

The inception of the industry on the Pacific coast may be said to have been about twenty-one years ago, when several schooners from Port Townsend, Wash., began to fish off Cape Flattery, but their catches were small. A few years later an eastern fish firm established a branch at Tacoma, which caused a transfer of the business almost entirely to that city. In the meantime, a demand had been created in the West for Pacific halibut, and in a few years more the fish houses of Seattle began to compete for the fish caught by the schooners, with the result that the trade shifted to that city, and the bulk of the schooner trade has been done there ever since. At the present time the International Fisheries Company, of Tacoma, a connection of an eastern house, handles the bulk of the steamer trade on the American side, while the New England Fish Company, of Vancouver, British Columbia, handles the bulk of the steamer trade on the Canadian side. The latter company, however, is an American corporation, with American-built vessels, and nearly all of its catch enters this country in bond free of duty. Both companies have special arrangements with the transcontinental lines by which their fish, fresh in refrigerator cars, are rushed through by passenger service, thus enabling the companies to place the fish on the Boston and Gloucester markets in from six to seven days after it is landed on the coast.

The New England Fish Company was the first to employ steamers in the fishery, beginning in 1897. At present it operates three steamers, while the Tacoma company has four steamers employed in fishing and transporting. Within the last year several steamers and power boats have been fitted out at Seattle to engage in the industry.

It was about 1895 when the southeast Alaska banks began to be resorted to by Seattle schooners in the winter, it not being possible to do anything on the Cape Flattery banks at that season of the year, and the British Columbia banks being closed to them. Most of the vessels fished around Dixons Entrance, while others worked in Chatham Strait and Frederick Sound, the latter making their headquarters in Wrangell Narrows and shipping the fish to Puget Sound ports on the regular steamers. The fishing was quite desultory, how-

ever, until 1899, when the Icy Strait Packing Company built a salmon cannery and a wharf at Petersburg, near the upper end of Wrangell Narrows, and arranged with the steamship companies to make regular calls for freight. From that time on the business rapidly concentrated at Petersburg, until now nearly all of the vessels make it their headquarters.

Since then a great development of the Alaskan halibut fisheries has occurred. In addition to the Seattle fleet, which comes up each winter to remain during the season, a few Alaskan sail and power vessels have entered the fishery. A considerable part of the business, however, is conducted on entirely different lines. A company or individual builds its plant in some place convenient to the fisheries and engages crews to go out in dories from day to day. Some have one central station and a number of subsidiary stations and employ a steamer to carry supplies from the former to the latter and bring back the fish caught. The principal halibut stations are Tee Harbor, Taku Harbor, Pleasant Bay, Wrangell Narrows, Ketchikan, Kake, Hoonah Village, Juneau, Fanshaw, Windom, and Farragut bays. At Tee Harbor and Taku Harbor large cold-storage plants are in operation in which the fish are frozen for shipment.

In addition to the wharf at Petersburg there were located in Wrangell Narrows in 1905 three large scows, each capable of taking care of from 200 to 400 boxes of halibut at a time. The schooners find it much easier to come alongside and discharge on these scows than on the wharf, while the steamer has very little difficulty in transferring the boxes from the scow to its hold. The scows are resorted to almost exclusively by the schooners and other sailing vessels from Seattle. Most of the steamers and power boats that fish in Alaskan waters in winter return to their home port to unload as soon as a fare has been secured. They usually make about two trips a month to the banks.

FISHING GROUNDS.

In the Pacific the halibut ranges from Bering Sea on the north, as far as present knowledge extends, to San Francisco and the Farallones on the south. According to the observations of Dr. T. H. Bean, the center of abundance is in the Gulf of Alaska, particularly off Kadiak and the Shumagin islands. Outside of Alaska the principal bank near American territory is found off Cape Flattery, in the mouth of the Straits of Fuca, in the state of Washington. Practically the entire catch by American vessels during the summer is made on this bank. In the winter months the supply comes entirely from scattering banks in southeastern Alaska, or from banks on the British Columbia coast outside the three-mile limit.

Of the former banks, Mr. A. B. Alexander[a], formerly fishery expert of the steamer *Albatross*, writes as follows:

Across Dixon Entrance, on the south side of Prince of Wales Island, in the vicinity of Nicholas Bay and Cape Chacon, a few schooners have taken good fares. Here, as at Cape Scott, the ground is made up of small "spots," which can only be located by landmarks. Only a few vessels can fish on this ground; it is said that even a small fleet would soon exhaust the ground, not permanently, but for some weeks. The Indians of this locality catch halibut here in considerable numbers, and from these people the white fishermen soon learn the best places.

* * * * * * *

Halibut on the northern banks are sometimes very erratic; in places where they are numerous one day few will be found the next. It frequently happens that a vessel will have good success for several days, and in a few hours' time fish will become so scarce that it is useless to remain longer on the ground. It is thought the fish are traveling in schools from one bank to another.

On all grounds halibut are more plentiful in winter than in summer and are scarcer in June than at any other time of the year. At this season they scatter all over.

During the salmon-canning season (June to November) many halibut are to be seen near the canneries, where they feed on the salmon offal thrown overboard.

No effort has yet been made to fish the large banks in central and western Alaska, owing to the distance from markets and the poor shipping facilities, but ultimately these will furnish the bulk of the product.

Very important grounds are located off the Queen Charlotte Islands and along the coast of British Columbia, but most of these are barred to American fishermen because they are within the three-mile limit.

It is barely possible that more extensive investigation would reveal the presence in southeast Alaska of large banks similar to those off the British Columbia coast.

METHODS OF THE FISHERY.

The method of catching halibut is almost the same as on the Atlantic coast. When the grounds are reached, the vessel scatters its dories around in favorable spots and then lies to for a while. There are generally two men to a dory. First the buoy is launched and the buoy line thrown out, this line being usually about 150 feet in length with an anchor attached to the end. The trawl lines in the vessel fisheries are generally about 1,800 feet in length, and usually three are joined together so as to make one continuous line. The gangings are about 5 feet long, are attached to the ground line, and are placed about 15 feet apart. They have the hooks and bait (usually herring) attached, and are placed so as to rest on the bottom.

[a] Notes on the halibut fishery of the northwest coast in 1895, by A. B. Alexander. Bull. U. S. Fish Com., vol. XVII, 1897 (1898), p. 141–144.

As soon as the buoy-line anchor has reached the bottom, the trawl is thrown from the side of the dory, and considerable skill is then necessary in order to place the trawl so that it will cover as much ground as possible and at the same time not get tangled up and crossed. In lifting the trawl the buoy line, with anchor, is taken in first and then the trawl. Sometimes a hurdy-gurdy (small windlass) is used in this work in order to facilitate matters. The fish are hauled to the surface, hit on the head with a club, unhooked, and thrown into the dory. Various other species besides the halibut are secured, but nearly all are thrown away. One of the greatest pests in the halibut fisheries of the Pacific, as well as of the Atlantic, is the dogfish, many of which get caught on the lines. They range in weight from 8 to 20 pounds, and are utterly valueless to the fishermen.

In the dory fishing from the regular Alaska shore stations the fishermen generally use 6 lines of about 150 feet each to each skate of gear, and 2 skates are used to a dory. Generally one skate is set out in the morning and the other in the afternoon. As a general thing the lines are set from one and a half to two hours and then taken up in the manner described above.

Hand lines, occasionally employed by the white fishermen, are nearly always used by the natives, who attach hooks of a very primitive but quite effective shape.

On the steamers the fishermen are generally paid from 20 to 25 cents apiece for the fish caught, the owner of the vessel furnishing everything necessary for carrying on the fishery, including provisions. The fisherman receives the same price for a small fish as for a large one. On the schooners the fishing is generally done on shares, the vessel as a usual thing taking one-third and the crew the balance. Under this plan all the living expenses are taken from the returns before the division is made. The boat furnishes the gear.

PREPARATION OF THE CATCH.

In shipping fresh fish the entrails are removed and the fish packed in ice in boxes holding about 500 pounds net weight. The ice used is gathered from the neighboring glaciers, and is in the best form for use if ground in a mill made for the purpose, but often it is merely broken into fine lumps with a club.

The large halibut and those secured where the opportunities for shipping are infrequent are fletched. In this process the two sides are taken off in two complete pieces, which are then put into bins and buried in salt so that the brine will run off. Here they remain from eight to ten days and are then repacked, being resalted if necessary, and allowed to remain until cured, when they are packed in boxes for shipment. A considerable part of this work is done during the summer months when it is not profitable to ship halibut fresh.

Large quantities of halibut are prepared each year by the Indians for food in the winter season. The fish are cut in strips, partially dried in the open air, and then suspended in the smoke from the fires generally built on the floor in the center of most of the Indian houses.

The possibility of developing an important and profitable industry in the canning of halibut has often been canvassed in Alaska, but the difficulty of interesting capital in an untried industry, when the profits of salmon canning have been so sure for many years, has usually been too great for the promoters. The first halibut canned in Alaska were put up at the Klawak cannery in 1878, when 200 or 300 cases of 2-pound cans (2 dozen cans in a case) were packed. This venture was continued for a few seasons, not more than 300 cases of 2-pound cans being packed in any one season, and then abandoned owing to the lack of a market for the product. In the summer of 1904 the Alaska Fish and Halibut Company opened a small cannery on Wrangell Narrows, just above Tonka, and put up an experimental pack of 41 cases of 1-pound flats (48 cans to the case). Some of the cases were shipped to Boston and other eastern points, and the balance distributed on the Pacific coast, where they have met with a very good reception. If the results of the experiment justify it, the company expects to put up a one-line cannery to be devoted exclusively to the packing of halibut. During the winter of 1904–5 the Juneau Packing Company, of Juneau, put up 36 1-pound cans as an experiment, and expects to enter into the business on a large scale should the goods meet with a favorable reception. The writer had an opportunity to see and taste these goods, and found them both pleasant to the eye and agreeable to the taste. The West Point Packing Company, at Petersburg, expected to put up a small pack in the winter of 1905–6.

One very favorable feature of this industry, if it be established, is that it can be prosecuted at all seasons of the year. Salmon canneries could be utilized when not engaged in the packing of salmon, thus saving the initial cost of a plant put up especially for halibut. The salmon canning season begins in June usually, and, with the exception of a few plants, closes by October. Halibut are most abundant during the winter months, the very season when the salmon canneries are shut down.

The Juneau Packing Company, of Juneau, put up a large smokehouse during 1904, and is now engaged in the smoking of halibut, herring, and salmon. The greater part of its prepared product is shipped to Puget Sound ports.

THE HERRING FISHERY.

HISTORY.

As early as 1878 persons in Wrangell engaged in the business of catching herring, from which they extracted the oil, in addition to salting and drying the fish. In 1880 the Western Fur and Trading Company, at their St. Paul (Kadiak Island) fishery, put up 500 boxes (30 pounds each) of smoked herring and 25 one-quarter barrels and 100 kits of salted herring.

The fertilizer plant at Killisnoo, on the island of Kenasnow, close to the western shore of Admiralty Island, owned and operated by the Alaska Oil and Guano Company, is the largest and oldest concern engaged in the herring fisheries. In 1882 the Northwest Trading Company, the predecessor of the present company, established at Killisnoo a small plant for extracting oil. As it proved successful it was gradually enlarged, and in 1884 the plant for the manufacture of guano was installed. The works at present are quite extensive, with commodious storehouses and a fine wharf. The common barrels used are made on the premises by machinery. As the fish while breeding are very poor and furnish no oil, the factory does not begin to operate until June, by which time the fish are feeding again and have commenced to fatten. In June it is estimated that one barrel of fish will furnish about half a gallon of oil; from this time the quantity obtained increases, until in the early part of September one barrel of fish produces about $3\frac{1}{2}$ gallons of oil. It then begins to decrease until in December a barrel of fish will produce about 2 gallons of oil. The factory is generally operated from June to December. The season is frequently shorter, however; in 1905 it ran from June to October. Three steamers are employed and the fish are taken by means of purse seines. A few herring are salted each season, also.

During the season of 1905 the Alaska Fish and Development Company, of Pleasant Bay, on Glass Peninsula, installed a fertilizer plant aboard a large hulk anchored in the bay, but they were unable to get it in readiness to operate before the season closed. They put up a considerable quantity of salted herring, however. In 1904 this company operated a trap net for herring in the bay, but it was not set in 1905.

From 1899 on, various companies and individuals put up salted herring at points along the coast south of the Aleutian chain. The fishing in Norton Sound and on the Yukon River is done by natives with seines, and the fish caught are either consumed locally or exchanged with the interior tribes for other articles.

On June 15, 1904, the sardine cannery of the Juneau Packing Company was opened at Juneau, and during the balance of the year put

up 3,173 cases of one-quarter oil and three-quarters mustard sardines, valued at $12,059. These were prepared from young herring. None were packed in 1905, owing to inability to compete with the excessively low prices quoted for eastern sardines. As the prices of the latter have gone up to a normal figure again, it is probable that it will now be profitable to operate the cannery. The company also put up smoked and salted herring in addition to other fishes.

There is room for a very great development of the herring industry. For many years salmon absorbed all the attention and capital, but since the slump in profits in the latter business during the last four years more attention has been directed to herring.

FISHING GROUNDS.

Herring are found in abundance at certain seasons of the year at many places on the Alaskan coast south of Bering Straits. They are rather erratic in their movements, however, being in one place especially abundant one year and totally absent the next, possibly returning again after several seasons in greater numbers than before. In southeast Alaska the herring arrive in April for the purpose of breeding, and deposit their eggs in countless numbers in the sea grass and rockweed near shore and on boughs of trees along the beaches near low-water mark. For many years the inlet at Kootznahoo, on Chatham Strait, was the favorite resort for herring, but they are much less abundant now, owing, it is claimed, to the constant fishing for them with purse seines, which breaks up the schools and drives them away. The northern shore of Kuiu Island and Gastineau Channel are also favorite spots, although the fish have been rather scarce in the latter place the last two seasons. They are quite abundant in Yakutat Bay, while Seldovia or Herring Bay, just inside the mouth of Cook Inlet, is a famous resort for them, immense schools making their appearance here each spring and autumn. About the middle of August large schools usually appear in the vicinity of Kadiak Island, and Captains Harbor, Unalaska Island, is frequented at certain seasons by large schools of exceedingly fat herring. Herring usually begin to arrive in the Yukon River from the 5th to the 20th of June. The run in Norton Sound is of very short duration, the fishing lasting only a fortnight, but the schools are said to be enormously large.

STATISTICS.

The table on page 22 shows the condition of the herring fishery from 1878, the first year for which reliable data could be secured. This table is not complete by any means, as salteries frequently spring up and are gone in a season, leaving no trace behind as to what they did.

Extent of the Herring Fisheries of Alaska, 1878 to 1905.

Year.	Fish utilized.	Products prepared.					
		Pickled.				Smoked.	
		Half barrels.		Barrels.			
	Pounds.	*Number.*	*Value.*	*Number.*	*Value.*	*Pounds.*	*Value.*
1878	37,500			150	$900		
1879	25,000			100	650		
1880	27,900			19	133	15,000	$750
1881							
1882	3,040,000						
1883	8,400,000						
1884	13,200,000						
1885	17,000,000						
1886	22,000,000						
1887	22,200,000						
1888	6,000,000						
1889	10,492,000						
1890	10,485,000						
1891	17,644,400	1,000	$3,750				
1892	18,716,000						
1893	14,450,000						
1894	15,306,000	1,000	3,500				
1895	6,510,000	500	1,750				
1896	5,550,000	250	875				
1897	7,120,000	950	2,850				
1898	9,048,000	1,300	3,900				
1899	8,110,000	1,650	4,950	3,200	16,000		
1900	13,006,250	185	555	3,885	19,425		
1901	14,600,000	400	1,200	8,000	40,000		
1902	9,546,800			5,490	27,450		
1903	13,689,000	710	2,130	2,225	11,125		
1904	15,963,500	150	450	2,250	11,250	450	50
1905	15,109,113	375	1,115	9,216	46,200	24,435	1,534
Total	297,276,463	8,470	27,025	34,535	173,133	39,885	2,334

Year.	Products prepared—Continued.						Total value.
	Sardines (canned).		Oil.		Guano.		
	Cases.	*Value.*	*Gallons.*	*Value.*	*Pounds.*	*Value.*	
1878							$900
1879							650
1880							883
1881							
1882			30,000	$7,500			7,500
1883			81,000	20,500			20,500
1884			192,000	48,000	1,200,000	$16,800	64,800
1885			300,000	75,000	(a)	(a)	75,000
1886			368,000	92,000	(a)	(a)	92,000
1887			335,000	83,750	(a)	(a)	83,750
1888			100,000	25,000	(a)	(a)	25,000
1889			157,900	39,475			39,475
1890			156,750	39,188			39,188
1891			242,050	60,513	1,600,000	22,275	86,538
1892			318,900	79,725	1,400,000	15,400	95,125
1893			223,450	55,863	1,800,000	22,500	78,363
1894			234,350	58,588	1,600,000	16,000	78,088
1895			101,650	22,363	1,000,000	10,000	34,113
1896			90,650	20,850	1,100,000	11,000	32,725
1897			125,000	31,250	1,560,000	17,600	51,700
1898			165,500	33,375	1,772,000	14,962	52,237
1899			128,000	25,600	1,428,000	12,852	59,402
1900			172,000	34,000	2,388,000	26,400	80,380
1901			200,000	50,000	2,500,000	33,750	124,950
1902			117,250	36,175	1,624,000	25,360	88,985
1903			146,250	39,473	2,688,000	33,600	86,328
1904	3,173	$12,059	152,500	41,375	3,041,800	38,125	103,309
1905			143,220	35,805	2,618,000	32,725	117,379
Total	3,173	12,059	4,281,420	1,055,368	29,319,800	349,349	1,619,268

(a) No record.

THE SALMON INDUSTRY.[a]

CANNERIES.

The first two canneries in Alaska were built in the spring of 1878—one at the Redoubt, Old Sitka, and the other at Klawak, both in Southeast Alaska. The latter was built by the North Pacific Trading and Packing Company, which still operates it. In Central Alaska the first cannery was built in 1882 at Karluk. The first in Western Alaska (Bristol Bay region) was constructed on the Nushagak River in 1884. By 1889 there were 37 canneries in operation, with a total output of 719,196 cases, a flood of canned salmon which was too much for the markets, so that by 1892 the number of canneries had fallen to 15, with an output of 474,717 cases. From this time on there was a gradual increase until 1902, when there were 64 establishments in operation, packing 2,545,298 cases; but the low prices prevailing during the last few years, owing to excessive competition, again reduced the number very materially, and in 1905 there were but 47 canneries, which put up 1,894,516 cases. The table below shows by sections and years the number of canneries operated and the pack. It has been found impossible to give the value of the pack, owing to the wide fluctuations in price and the fact that establishments frequently held their pack for several seasons before disposing of it.

PACK OF CANNED SALMON IN ALASKA, 1878 TO 1905.

Year.	Southeast Alaska.		Central Alaska.		Western Alaska.		Total.	
	Canneries.	Pack.	Canneries.	Pack.	Canneries.	Pack.	Canneries.	Pack.
		Cases.		*Cases.*		*Cases.*		*Cases.*
1878	2	8,159					2	8,159
1879	2	12,530					2	12,530
1880	1	6,539					1	6,539
1881	1	8,977					1	8,977
1882	1	11,501	2	10,244			3	21,745
1883	4	20,040	2	28,297			6	48,337
1884	4	22,189	2	42,297	1	[b] 400	7	64,886
1885	3	16,728	2	52,687	1	14,000	6	83,415
1886	4	18,660	2	74,583	3	48,822	9	142,065
1887	5	31,462	2	102,515	3	72,700	10	206,677
1888	6	81,128	6	241,101	4	89,886	16	412,115
1889	12	141,760	21	461,451	4	115,985	37	719,196
1890	12	142,901	19	421,300	4	118,390	35	682,591
1891	11	156,615	14	511,367	5	133,418	30	801,400
1892	7	115,722	6	295,496	2	63,499	15	474,717
1893	8	136,053	11	399,815	3	107,786	22	643,654
1894	7	142,544	10	435,052	4	108,844	21	686,440
1895	7	148,476	10	327,919	6	150,135	23	626,530
1896	9	262,381	12	485,990	8	218,336	29	966,707
1897	9	271,867	13	382,899	7	254,312	29	909,078
1898	9	251,385	14	395,009	7	318,703	30	965,097
1899	9	310,219	14	356,095	9	411,832	32	1,078,146
1900	16	456,639	14	492,223	12	599,277	42	1,548,139
1901	21	742,914	13	562,142	21	719,213	55	2,024,269
1902	26	915,150	12	583,690	26	1,046,458	64	2,545,298
1903	21	645,232	12	417,175	27	1,186,730	60	2,249,137
1904	12	464,545	11	499,485	32	989,716	55	1,953,746
1905	13	433,607	9	371,755	25	1,089,154	47	1,894,516
Total		5,975,923		7,950,587		7,857,596		21,784,106

[a] No effort is made to give a detailed history of the fishery or of the methods followed, as these have been treated of, quite at length, in the publications of the Bureau and in the yearly reports of the agents appointed by the government to see that the salmon law is enforced.

[b] Experimental pack.

SALTERIES.

The oldest Alaska salmon saltery now in existence is that established by Baronovich, a Greek or Slav, who had married the daughter of Skowl, one of the old-time chiefs of the Kasaans, and received from him the fishery on Karta Bay now known as Baronovich's Fishery. The saltery is operated only occasionally now.

The table below shows the pack of salted salmon since 1868. The salt salmon trade was so overshadowed by its giant brother, the canned trade, that it is frequently lost sight of or swallowed up in the latter. As a result it has been an exceedingly difficult matter to secure accurate data, and it is probable that a considerable part of the trade, especially in the earlier years, has been overlooked. The preparing of dry-salted dog salmon for market was first attempted in 1899. In 1900 a number of persons rushed into the business and overstocked the market, with the result that the industry became unprofitable and nothing was attempted for two seasons, when the demands of the Japanese trade for a cheap dry-salted fish caused a revival of the business. From 225 to 250 dog salmon are required to make a prepared ton of dry salted. These are packed in boxes holding about 560 pounds net. Fifteen pounds of salt are required to a box of fish, while the box itself weighs 95 pounds.

PACK OF SALTED SALMON IN ALASKA, 1868 TO 1905.

Year.	Salmon.		Salmon bellies.		Dry-salted salmon.	
	Barrels.	Value.	Barrels.	Value.	Pounds.	Value.
1868	2,000	$16,000				
1869	1,700	13,600				
1870	1,800	14,400				
1871	700	6,300				
1872	1,000	9,000				
1873	900	7,200				
1874	1,400	11,200				
1875	1,200	9,600				
1876	1,800	14,400				
1877	1,950	15,700				
1878	2,100	16,800				
1879	3,500	28,000				
1880	3,700	29,600	300	$3,300		
1881	1,760	15,840				
1882	5,890	53,010				
1883	7,251	65,259				
1884	6,106	54,954				
1885	3,230	29,070				
1886	4,861	43,749				
1887	3,978	35,802				
1888	9,500	85,500				
1889	6,457	58,013				
1890	18,039	162,351				
1891	8,913	71,304				
1892	17,374	140,057	53	815		
1893	24,005	120,083				
1894	32,011	176,060				
1895	14,234	85,404				
1896	9,314	65,198	150	1,200		
1897	15,848	110,936	2,846	28,460		
1898	22,670	181,360	580	5,800		
1899	22,382	167,865	235	2,350		
1900	31,852	238,890	2,353	23,530	511,400	$10,228
1901	24,477	171,339	652	3,816		
1902	30,384	212,688	328	2,952		
1903	27,921	223,368	3,667	32,973	300,000	5,500
1904	13,674	89,209	208	1,950	966,812	16,180
1905	19,071	143,811	1,360	11,355	7,280,234	115,643
Total	404,952	3,108,952	12,732	118,501	9,058,446	147,551

FREEZING SALMON.

The preparing of frozen salmon began in 1902. The San Juan Fishing and Packing Company, soon to be succeeded by the Pacific Cold Storage Company, put up a cannery and cold-storage plant at Taku Harbor, Southeast Alaska, in 1901, though it did not operate the cold-storage portion until 1902. The quantity prepared that year was not reported by the company. It appears that in 1903 the pack was valued at $50,000 and in 1904, 57,427 pounds were frozen. In 1905 the pack was as follows: King salmon, 21,643 pounds, valued at $866; silver salmon, 22,334 pounds, $893; pink salmon, 16,348 pounds, $654, and steelhead trout, 12,306 pounds, $738. Nearly all of this frozen fish is shipped to Europe.

The season of 1905 witnessed the inception of a new branch of the salmon fishery. About the middle of January king salmon were observed in the vicinity of Ketchikan, but it was not until January 23 that the first fish were brought to this place for sale. News of the heavy run of fish having spread very rapidly, there were soon a large number of whites and Indians out in canoes catching them. The fish were feeding on the schools of young herring, and as they were close to the reefs nets could not be employed, and trolling lines were brought into use. At first herring bait was employed, but it was soon discovered that a nickel trolling spoon would answer the purpose just as well. The vicinity of Point Comano and Point Stewart seemed to be favorite spots for the fish, but they were to be found almost everywhere within a radius of 50 miles from Ketchikan. Several firms in Ketchikan early saw the financial possibilities of the business and soon had out steamers and launches to collect the fish from the fishing boats and bring them to Ketchikan to be packed in ice and shipped to Puget Sound ports. The fish averaged 25 pounds in weight. One weighed 77 pounds and several 75 pounds each. About 25 per cent of the catch consisted of white-meat fish and 75 per cent of red-meat fish. For the former the fishermen were paid 25 cents each and for the latter 50 cents each. During the run, which lasted until May 18, 271,644 pounds, valued at $15,600, were shipped. A considerable quantity was cured by the Indians for their own use also.

HATCHERIES.

A few of the more far-sighted cannerymen early saw the necessity of repairing, by artificial means, the enormous drain upon the supply of salmon caused by the large number of canneries in operation. In 1891 the several canneries in operation at Karluk combined forces and built a hatchery on the lagoon at that place. There were 2,500,000 eggs taken, but owing to bad water, crude appliances, and want of experience, only about 500,000 fish were hatched. As the cannerymen could not agree in regard to fishing operations in 1892, the

hatchery scheme also fell through and the plant was closed up. In that year Mr. John C. Callbreath, manager of the Point Ellis cannery, on Kuiu Island, operated a small hatchery on the left bank of Kutlakoo stream. It was a very primitive affair, the work all being conducted without shelter. About 1,000,000 eggs were fertilized and placed in the baskets, but after they commenced hatching an exceptionally high September tide destroyed the plant and it was never rebuilt. During the spring of the same year the Point Ellis cannery burned, and Mr. Callbreath, after seeing to the operation of the hatchery, returned to Wrangell to engage in business. Here his attention was attracted again to hatchery work and he made arrangements with the Indians for the right to Jadjeska stream, which empties into McHenry Inlet on Etolin Island, and in the fall of 1892 built a small hatchery about 200 yards from the mouth of the stream. The stream is about one-half mile in length and is the outlet of a small lake 42 feet above tide water. Finding the location unsuitable, Mr. Callbreath removed the hatchery in 1893 to the northern side of the lake, about three-eighths of a mile from the head of the outlet, where it at present stands. This hatchery is a private enterprise, being unconnected with any cannery or fishery, and is supported wholly by its public spirited and enterprising owner.

In 1896 the Baranof Packing Company, which operated a cannery on Redfish Bay, on the western coast of Baranof Island, built a small hatchery on the lake at the head of Redfish Stream. When 200,000 eggs were in the water very cold weather set in and not only froze the flume solid, but also froze the whole cataract. As the hatchery was thus left without water, the eggs were put into the lake and left to their fate and the hatchery closed down permanently.

In May, 1896, the Alaska Packers' Association broke ground for a hatchery at the eastern end of the Karluk lagoon, near the outlet of Karluk River, and but a short distance from where the hatchery was located in 1891. This was the first large hatchery built in Alaska and at the start had a capacity of several million eggs, which was largely increased from season to season for some years until in 1905 it had a capacity of about 40,000,000.

In 1897 the North Pacific Trading and Packing Company, at Klawak, Prince of Wales Island, established a hatchery near the head of Klawak stream, close to Klawak Lake. In 1898 the establishment was moved to the mouth of Threemile stream, a lake feeder on the northern side.

The Pacific Steam Whaling Company in 1898 erected a small hatchery on Hetta stream on the west side of Prince of Wales Island, which was operated until the close of the hatching season of 1903–4, when the Pacific Packing and Navigation Company, successor to the original owner, went into the hands of a receiver. This company was the owner of two other small hatcheries also, both built in 1901, one on the stream entering Mink arm of Quadra Bay, on the mainland, and

one on a stream entering Freshwater Lake Bay, Chatham Strait. These likewise closed when the company failed.

In 1901 the Alaska Packers' Association erected a hatchery on Heckman Lake, the third of a series of lakes on Naha Stream, and about 8 miles from Loring, where the association has a cannery. The association has expended a great deal of money on this hatchery and has made it the largest and most expensive in the world. At present it has a capacity of 110,000,000 eggs, but it has never been possible to secure enough to fill it.

The Union Packing Company, at Kell Bay, on Kuiu Island, and Mr. F. C. Barnes, at Lake Bay, on Prince of Wales Island, in 1902 built and operated small hatcheries, but with very indifferent success, and both abandoned the attempt after one season's work.

In 1905 the United States Bureau of Fisheries took up the work of hatching in Alaska, and began the erection of a hatchery on McDonald Lake, which empties through a short stream into Yes Bay, on Cleveland Peninsula. As the hatchery proper was not far enough complete to operate when the time for stripping came, in September, the eggs secured were placed in the flume built to bring the water to the hatchery.

Five hatcheries were in operation in 1905–6, and the value of these, together with the Hetta hatchery, which is in condition to operate at any time, is about $315,000.

The table below shows the hatcheries which operated successfully from 1892 or at least one season, and gives the number of eggs secured and the number of fry liberated each season. This represents almost wholly redfish, but a few million cohoes having been hatched. The periods represented are fiscal years, because the spawning season, the winter months, covers parts of two calendar years.

OUTPUT OF THE SALMON HATCHERIES OF ALASKA, 1893 TO 1906.

Year ended June 30—	Callbreath's hatchery.		Karluk hatchery.		Klawak hatchery.	
	Eggs taken.	Fry liberated	Eggs taken.	Fry liberated.	Eggs taken.	Fry liberated.
1893	900,000	600,000				
1894	3,000,000	2,204,000				
1895	6,300,000	5,291,000				
1896	6,200,000	5,475,000				
1897	5,400,000	4,390,000	3,236,000	2,556,440		
1898	3,400,000	2,526,000	8,454,000	6,340,000	2,023,000	800,000
1899	3,000,000	2,050,000	4,491,000	3,369,000	3,600,000	3,000,000
1900	3,400,000	2,335,000	10,496,900	7,872,000	3,600,000	[a] 1,000,000
1901	[b]		19,334,000	15,566,800	[c]	
1902	6,000,000	5,500,000	32,800,000	28,700,000	3,500,000	2,800,000
1903	6,000,000	5,000,000	23,400,000	17,555,000	3,500,000	1,500,000
1904	6,000,000	5,000,000	28,113,000	22,000 000	3,000,000	1,700,000
1905	6,050,000	5,250,000	45,500,000	33,670,000	2,800,000	2,000,000
1906 [d]	7,700,000	6,500,000	36,933,000	32,501,040	2,800,000	2,000,000
Total	[e] 63,350,000	52,121,000	212,757,900	170,130,280	24,823,000	14,800,000

[a] A hard freeze killed most of the eggs.
[b] None stripped.
[c] Eggs all frozen.
[d] As the take of eggs for 1905–6 had not been hatched out when this report was prepared, the number of fry had to be estimated.
[e] The number of eggs taken in each season at this hatchery has been estimated.

OUTPUT OF THE SALMON HATCHERIES OF ALASKA, 1893 TO 1906—Continued.

Year ended June 30—	Hetta hatchery.		Quadra Bay hatchery.		Freshwater Bay hatchery.		Fortmann hatchery.	
	Eggs taken.	Fry liberated.	Eggs taken.	Fry liberated.	Eggs taken.	Fry liberated.	Eggs taken.	Fry liberated.
1893								
1894								
1895								
1896								
1897								
1898								
1899	2,800,000	2,600,000						
1900	2,000,000	1,500,000						
1901	1,800,000	[a] 500,000						
1902	2,500,000	1,700,000	4,500,000	3,500,000	1,500,000	1,000,000	11,460,000	10,300,000
1903	4,800,000	4,000,000	5,500,000	4,000,000	[b]	[b]	40,050,000	29,005,000
1904	5,127,500	3,750,000	600,000	[c] 400,000	[d]	[d]	22,203,000	13,780,000
1905	[e]	[e]	[e]	[e]	[e]	[e]	65,010,000	63,181,000
1906 [f]	[e]	[e]	[e]	[e]	[e]	[e]	71,139,000	65,313,710
Total	19,027,500	14,050,000	10,600,000	7,900,000	1,500,000	1,000,000	209,862,000	181,579,710

Year ended June 30—	Kell Bay hatchery.		McDonald hatchery.		Total.	
	Eggs taken.	Fry liberated.	Eggs taken.	Fry planted.	Eggs taken.	Fry liberated.
1893					900,000	600,000
1894					3,000,000	2,204,000
1895					6,300,000	5,291,000
1896					6,200,000	5,475,000
1897					8,636,000	6,946,440
1898					13,877,000	9,666,000
1899					13,891,000	11,019,000
1900					19,496,900	12,707,000
1901					21,134,000	16,066,800
1902					62,260,000	53,500,000
1903	2,500,000	2,000,000			85,750,000	63,060,000
1904	[e]	[e]			65,043,500	46,630,000
1905	[e]	[e]			119,360,000	104,101,000
1906 [f]	[e]	[e]	7,000,000	5,000,000	125,572,000	111,314,750
Total	2,500,000	2,000,000	7,000,000	5,000,000	551,420,400	448,580,990

[a] Many eggs frozen.
[b] No run of fish.
[c] Hatchery was not used, the eggs being hatched out in the lake.
[d] No report.
[e] Not operated.
[f] As the take of eggs for 1905-6 had not been hatched when this report was prepared, the number of fry had to be estimated.

FERTILIZER PLANTS.

As noted elsewhere, the Alaska Oil and Guano Company has operated a herring fertilizer plant at Killisnoo for some years. During 1905 the Alaska Fish and Development Company, at Pleasant Bay, built a small fertilizer plant in an old hulk, which can be moved from place to place as desired. The company expects, when the plant is working, to utilize the salmon and herring offal from its saltery.

The Pacific Coast and Norway Packing Company also put in a small fertilizer plant in connection with its salmon cannery at Tonka in 1905. The plant cost about $3,500 and will have a capacity of 12 tons daily. The intention is to use the waste product of the cannery, and as the noxious gases which make a fertilizer plant so offensive are piped off into the furnace and there consumed it has been possible to build the plant immediately alongside the cannery building. The manager of the cannery estimates that when reduced a ton of salmon offal will make from 400 to 500 pounds of fertilizer and 150 pounds (about 20 gallons) of oil.

In 1904 the North Pacific Fish and Oil Company established a fertilizer plant at Grace Harbor, on Dall Island. It was the intention of the company to utilize the offal from a nearby salmon saltery and also such little used species as mud sharks, dogfish, etc. Unfortunately the plant proved unworkable and has not yet been remodeled to suit Alaskan conditions.

As the offal from the salmon canneries alone amounts to over 35,000,000 pounds in a season, all of which is at present thrown overboard and allowed to pollute the waters, it is easily to be seen that if small fertilizer plants could be installed at each cannery to treat this offal, as is done at the sardine canneries in Maine, this enormous annual wastage would be obviated and the waters adjacent to the canneries rendered more agreeable, not only to the denizens of the water but also to the chance visitor.

Oil.—For many years the Indians have engaged in catching the dogfish (*Squalus sucklii* Girard) and extracting from it an oil which they sell to the traders. Loring has always been a favorite resort for these fishermen, as the dogfish are especially abundant in that vicinity. It is estimated that as much as 10,000 gallons of this oil were obtained in 1892. The only firm of white men engaged in this business at present is the Ketchikan Ka-ko Oil Company, which has a small plant at Loring. The livers alone are utilized, the rest of the fish being thrown away. The oil, because of its heavy body and freedom from grit, is a most desirable lubricant and finds a ready sale in logging camps as "skid grease." In 1904 the company refined part of its product and is now endeavoring to introduce it as a medicinal oil, for which they claim it is well suited.

AQUATIC FURS.

Of the few industries followed in Alaska that of hunting the fur-bearing animals is one of the most important. Owing to the immense extent of territory still unoccupied except by a few small tribes of Indians or Eskimos, it is probable that the industry, so far as it relates to aquatic animals in the interior waters, will thrive for some years to come. Those fur-bearing animals, such as the seal and sea otter, found along the shores of the mainland and adjacent islands and the open sea, where they can easily be hunted, are rapidly becoming extinct. This fact has already had a very important bearing on the welfare of the coast tribes, as they have been dependent at many places upon their catch of these animals for the means wherewith to secure the very necessaries of life.

The fur traders have their stations located at convenient points, and from these in the spring and summer send out vessels to visit branch stations or certain rendezvous, where they secure from the natives their catch of the past year and pay for the same in goods. In the interior the traders usually fit out trusty natives with small

stocks of goods to travel among those more distant tribes which can not reach the stations. The prices paid are regulated by the standard price of red fox or marten, called 1 skin, which in 1890 was about $1.25. In 1890 a prime beaver was put in as 2 skins; black bear, 4 skins; lynx, 1 skin; land otter, 2 or 3 skins. Five yards of drilling or 1 pound of tea or 1 pound of powder, or half a pound of powder with 1 box of caps and 1 pound of shot, are given for 1 skin; 50 pounds of flour for 4 skins; 5 pounds of sugar for 1 skin. In the mining districts the prices are much higher, to conform to those paid by the miners.

Beaver.—This is the most valuable of the fur-bearing aquatic animals of the interior waters of Alaska, and since the district was acquired by the United States has been hunted with such vigor that its numbers are very much diminished and diminishing. The range of this animal covers all of the mainland of Alaska, excepting only the belt of barren-coast country bordering the Arctic Ocean from Point Hope north and east to the Canadian line. The numerous lakes and ponds and the clear streams of the interior, especially those bordered by alders and willows, are the beaver's favorite resorts. It generally avoids the large rivers, owing to the great change in level likely to occur at different seasons. The natives catch beavers in steel traps set at a frequented spot or shoot them from a concealed place near their house or dam. The natives of eastern Siberia prize the fur of the beaver very highly for trimming their fur clothing, and during the summer months many of the skins are taken across Bering Straits by the Eskimos and traded to the Siberian natives for the skins of the tame reindeer. Castoreum, an oily odorous compound secreted by the preputial glands of the animal, also the dried preputial follicles and their contents, are sometimes prepared and find a sale in China, where they occupy a place in the pharmacopœia. In 1905 but 5 pounds, valued at about $16, were prepared. From 1745 to 1867, the period covered by the Russian occupation of Alaska, 413,356 beaver skins were secured by her traders.

Muskrat.—Wherever bogs and ponds or running water occur on the mainland, except along the extreme northern coast line, this animal will be found; it is also found upon Nunevak and St. Michaels islands. It is trapped in small steel traps or in wicker fish traps. The greater part of the skins are bought by the traders for the purpose of bartering them off in other localities for more valuable furs, hence but few of them reach the outside world. They are used by the natives for making fur clothing and blankets or robes.

Land otter.—This species is one of the most widely distributed in the district, being found on the whole coast of Alaska from the southern boundary to the northern shore of Norton Sound. It also occurs on all the islands inside of these limits as far as Unimak in the west and Nunivak in the north. Within the Arctic Circle it is confined to the

upper courses of the rivers emptying into the Arctic Ocean. It is quite generally distributed over the interior of the Territory and is also found on the Kadiak Archipelago. The land otters found upon Sitkalidak, one of the Kadiak group, are famous for their very dark fur. A steel trap is generally used in capturing the animal. According to Russian records 244,538 of these skins were bought by the traders from 1745 to 1867, the date of American annexation. Since then the supply has remained fairly constant.

Sea otter.—When Bering and his party first explored the Aleutian Islands in 1760–1765 they found the sea otters exceedingly numerous all along the Aleutian chain. They are now almost unknown around a greater part of it, their principal resort at present being among the reefs and outlying islets surrounding Sannak Island, near the eastern end and on the Pacific side of the chain. The Aleutian hunters are brought to this point in vessels belonging to the trading companies and to private individuals, and landed with their bidarkas or skin canoes and hunting equipment. Here they remain for months, scouring the sea in all directions or lying upon rocky points and islets awaiting the approach of an otter within long rifle shot. The fur of this animal is the most valuable in the world. Even as far back as 1880 from $80 to $100 in cash were paid by the traders to the Aleuts for particularly fine skins. At the London sales in 1888 the average price received for these skins was £21 10s.; in 1889, £33; and in 1891, £57. A single skin, however, has sold for as high as $1,400, and in 1905 a trader at Nome valued one skin which he had secured at $2,000. During the Russian occupation (from 1745 to 1867) 260,790 sea otter skins are reported as having been shipped from Alaska.

The following table shows the number and value of the aquatic furs, other than seal, obtained in Alaska and shipped from the district from 1868 to 1905, both inclusive:

AQUATIC FURS OBTAINED IN ALASKA, 1868 TO 1905.[a]

Year.	Beaver.		Muskrat.		Otter, land.		Otter, sea.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
1868–1870	17,041	$85,205	17,908	$895	6,367	$31,835	12,208	$1,220,800	53,524	$1,338,735
1871–1880	41,217	206,085	50,322	2,516	27,730	138,650	40,283	4,028,300	159,552	4,375,551
1881–1890	60,940	304,700	90,000	4,500	27,730	138,650	47,842	4,784,200	226,512	5,232,050
1891–1900	21,810	109,050	30,000	1,500	21,000	105,000	6,467	646,700	79,277	862,250
1901–1904	7,740	38,700	50,396	2,520	8,556	68,448	260	39,000	66,952	148,668
1905	1,935	8,271	12,599	1,192	1,889	14,458	61	13,867	16,484	37,788
Total	150,683	752,011	251,225	13,123	93,272	497,041	107,121	10,732,867	602,301	11,995,042

[a] The values given, except in 1905, are the prices realized in London.

Fur seal.—It would be superfluous to go into any detail in regard to the general subject of the fur seal, as the existing literature devoted to this animal would constitute a large library in itself. The only breeding grounds are on the islands of St. Paul and St. George in Bering Sea. From about 1745 until the district of Alaska was annexed

to the United States in 1867 the Russians took from these islands 3,354,478 skins. In 1870 the Alaska Commercial Company secured from the Government the exclusive right to kill fur seals on the islands, and retained this right until 1890, when it was succeeded by the North American Commercial Company, which is still in possession. The decrease in the number of seals since 1867 has been enormous. It is estimated that in 1867 the herd numbered about 5,000,000, while in 1905 it was only about 200,000. A considerable part of this decrease is attributed to the killing of female seals by the pelagic sealing vessels. On their way to the breeding grounds the seals follow the coast line from Santa Barbara Channel northward and throughout this journey they are eagerly sought by the pelagic sealers. A little measure of relief to the harassed herd was extended by the decision of the Bering Sea Arbitration Tribunal in 1893, but the slaughter was soon resumed. The table below shows the catch of fur seals from 1867 to date both on the islands and from pelagic and other sources, presumably within Alaskan waters. The values given are those received in London at the great auction sales held there several times each year.

FUR-SEAL SKINS OBTAINED FROM THE SEAL ISLANDS AND FROM PELAGIC AND OTHER SOURCES, ALL IN WATERS OF ALASKA, 1868 TO 1905.

Year.	From seal islands.		From pelagic and other sources.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.
1868	140,000	$700,000	4,367	$8,734	144,367	$708,734
1869	85,901	644,258	4,430	8,860	90,331	653,118
1870	23,773	166,411	8,686	21,715	32,459	188,126
1871	102,960	1,544,400	16,911	40,586	119,871	1,584,986
1872	108,819	1,218,774	5,336	12,806	114,155	1,231,580
1873	109,117	1,418,421	5,229	20,886	114,346	1,439,307
1874	110,585	1,448,663	5,825	49,513	116,410	1,498,176
1875	106,460	1,357,365	5,033	45,297	111,493	1,402,662
1876	94,657	828,249	5,515	28,954	100,172	857,203
1877	84,310	822,023	5,210	31,260	89,520	853,283
1878	109,323	1,071,365	5,540	38,780	114,863	1,110,145
1879	110,511	2,340,713	8,557	111,241	119,068	2,451,954
1880	105,718	2,347,687	8,418	117,852	114,136	2,465,539
1881	105,063	2,086,193	10,382	80,979	115,445	2,167,172
1882	99,812	1,357,443	15,581	79,463	115,393	1,436,906
1883	79,509	1,606,082	16,587	104,498	96,096	1,710,580
1884	105,434	1,340,096	16,971	114,554	122,405	1,454,650
1885	105,024	1,491,341	23,040	149,760	128,064	1,641,101
1886	104,521	1,788,335	28,494	199,458	133,015	1,987,793
1887	105,760	1,480,640	30,628	235,836	136,388	1,716,476
1888	103,304	2,014,370	36,389	283,834	139,693	2,298,204
1889	102,617	1,744,489	29,858	291,116	132,475	2,035,605
1890	28,859	1,053,354	40,814	620,403	69,673	1,673,757
1891	14,406	432,180	59,568	938,196	73,974	1,370,376
1892	7,509	225,270	46,642	792,914	54,151	1,018,184
1893	7,390	199,530	30,812	385,150	38,202	584,680
1894	15,033	318,176	61,838	541,083	76,871	859,259
1895	14,846	300,631	56,291	576,983	71,137	877,614
1896	30,654	521,118	43,917	351,336	74,571	872,454
1897	19,200	297,600	24,332	158,158	43,532	455,758
1898	18,047	288,752	28,552	185,588	46,599	474,340
1899	16,812	437,112	34,168	350,222	50,980	787,334
1900	22,470	719,040	35,191	563,056	57,661	1,282,096
1901	23,066	770,848	24,050	366,763	47,116	1,137,611
1902	22,182	721,175	22,812	439,131	44,994	1,160,306
1903	19,292	566,754	27,000	499,500	46,292	1,066,254
1904	12,960	388,800	11,523	232,140	24,483	620,940
1905	12,723	508,920	12,660	253,200	25,383	762,120
Total	2,488,627	38,566,578	857,157	9,329,805	3,345,784	47,896,383

At one time it was thought that the problem of furnishing a permanent supply of food for the natives on the Pribilof and Aleutian groups could be solved by salting the carcasses of the fur seals and shipping these to the various settlements. In 1880, 1,000,000 pounds, valued at $10,000, were so prepared, but owing to the fact that the meat did not keep very well, and to other causes, the project was soon abandoned. The natives living on the Pribilof group, however, still depend quite largely upon the seal carcasses for food.

MISCELLANEOUS AQUATIC ANIMALS.

Grampus.—This mammal, commonly known as the beluga in Alaska, is quite abundant in the summer along the Alaskan coast north of the Aleutian chain, being particularly numerous about the mouths of rivers and frequently ascending the larger streams far above tide water. It is migratory, and its movements are regulated by the ice. The numerous tidal creeks along the low flat coast from St. Michaels to the Kuskoquim River, in which tomcods are abundant, are the chief resort of the beluga, which comes in to feed on the fish. The Eskimos catch them with strong, large-meshed nets, heavily weighted, set off outlying points. In rough weather, when the animals can not see the nets, many are taken, but in clear weather the catch is small. Some are speared, some shot, but unless the shot goes through the spinal column these generally escape. The flesh of a young beluga is tender and not unpalatable, but is rather coarse and dry. The fat, or blubber, is clear and white and is highly valued by the natives, who extract the oil from it and use it in barter with the interior tribes. The intestines are made into waterproof garments or floats, and the sinews are very much prized. The small ivory teeth are carved into toys or ornamental pendants, while the skin is made into strong lines or very durable boot soles. The epidermis, which is nearly half an inch thick, when well cooked is considered choice eating, having a flavor somewhat resembling chestnuts.

Hair seals.—While these animals form a very insignificant part of the commerce in which the white traders participate, owing to the fact that their fur is worthless, they are of immense importance to the natives, for from the flesh and oil is secured a considerable part of their winter food, while the skins are highly prized for covering the kyacks and umiaks and for boot soles, trousers, mittens, clothing bags, and caps, and when cut into strips make a very strong and durable cord. The skin in its raw state is thick and unwieldy, but when nicely tanned becomes soft and pliable. The coast natives also barter the flesh, oil, and skins with the interior tribes for reindeer hides and furs, thus creating a very important branch of trade, of which it is impossible to form an idea, owing to the inaccessibility of

most of the tribes. The very fragmentary record kept of the skins sold to white traders shows that in 1889, 3,500 skins, valued at $7,000, in 1890, 3,444, valued at $6,888, and in 1905, 9,098 skins, valued at $5,554, were so disposed of. These meager figures are probably too low.

The species taken are the bearded seal (*Erignathus barbatus*); the ribbon seal (*Phoca fasciata*), a rare species; the ringed seal (*Phoca fœtida*), the most common; the harp seal (*Phoca grœnlandica*), quite rare; and the harbor seal (*Phoca vitulina*), which is quite common and the most widely distributed.

When the ice leaves the coast the natives hunt the seals in kyacks, using a light spear or a rifle. At this season many of the ringed seal are found upon the ice packs well offshore and are taken by the Eskimo in a curious manner. The latter wear a shirt made of white sheeting, and, paddling cautiously up to a piece of ice on which the seals are gathered, are enabled by means of the disguise to land and get among the seals without alarming them, and sometimes kill quite a number with a club before the herd takes flight. When the cold storms of September set in the seals return along shore again and seek refuge in the inner bays and sheltered coves. At this season the natives set many rawhide nets with large meshes off the rocky points, and large numbers are taken thus. Later, when the sea is frozen over, nets are set about the holes which the seals make in order to be able to come to the surface to breathe. Many of the seals also are killed at these holes by the hunters armed with spears.

Steller's sea lion.—This animal, which at one time was extremely abundant on the Pribilof Islands and along the Aleutian chain, is now almost extinct. A few still haul up on the former islands, but they are becoming less and less each year, a fact which means a serious loss to the natives, as they made more use of this animal than of any other they hunted. Its skin, flesh, intestines, bones, sinews, and oil all came into play as food or in the primitive manufactures. The skins were considered an indispensable covering for the umiak, or large canoe, used in hunting, and after the animal became practically extinct on the Aleutian chain the traders imported such skins from the coast of Lower California and Mexico for the use of their hunters. The sea lion never became other than a subject of intertribal barter.

Walrus.—This enormous mammal, which is not found south of the Bering Sea shore of the Aleutian chain, was at one time very numerous north of there, and the hunting of it and the seal formed the principal occupation of the Eskimos during the summer. It goes north as the ice breaks up in spring and returns again in the fall, stopping but a short time at any spot, and keeping close to the ice pack all this time. When in the water it is hunted by the Eskimos in kyacks, with

ivory-pointed spears and seal-skin line and floats. When the animal is exhausted by its efforts to escape the hunters draw near and give the death stroke with a lance.

According to The Friend, published at Honolulu, Hawaii, March 1, 1872, the whalers began to turn their attention to walrus-catching about the year 1868. During the first part of every season there is but little opportunity to capture whales, they being within the limits of the icy barrier. As a result, much of the whaler's time during July and August was devoted to capturing walruses. Men would be landed on the shore in June and left to watch for the animals to haul up on the beach at certain points. The walrus must either come ashore or get on the ice, and when a herd is well ashore one or two old bulls are generally left on watch. The best shot among the hunters now creeps up, and by a successful rifle shot or two kills the guard. Owing to their very defective hearing, the noise made by the rifle does not awake them. The gun is then put aside and each hunter, armed with a sharp ax, approaches the sleeping animals and cuts the spines of as many of them as possible before the others become alarmed and stampede for the water and escape.

The white hunters rarely make use of anything but the two long, curved tusks with which the animal is equipped and which average about 5 pounds to the pair. If time permits, however, the flesh is boiled and the oil saved. To many of the Eskimos, especially on the Arctic shore, the walrus is almost a necessity of life, and the devastation wrought among the herds by the whalers has been, and is yet, the cause of fearful suffering and death to many of the natives. The flesh is food for men and dogs; the oil also is used for food and for lighting and heating the houses; the skin, when tanned and oiled, makes a durable cover for the large skin boats; the intestines make waterproof clothing, window-covers, and floats; the tusks are used for lance or spear points or are carved into a great variety of useful and ornamental objects, and the bones are used to make heads for spears and for other purposes. At the present time the Kuskoquim district is the only one in which the walrus is fairly common.

In addition to hunting the walrus themselves, the whalers also purchase from the Eskimos the tusks, or ivory, that they have secured. The table on page 36 shows the quantity and value of walrus oil and ivory secured since 1868. Part of this was undoubtedly secured from the natives of Siberia, but that is more than offset by the large quantity which has been brought down by the whalers and not reported.

WALRUS IVORY AND OIL SECURED IN ALASKA, 1868 TO 1905.

Year.	Ivory.		Oil.		Year.	Ivory.		Oil.	
	Pounds.	Value.	Gallons.	Value.		Pounds.	Value.	Gallons.	Value.
1868	40,000	$2,000	173,000	$86.500	1888	5,158	$5,158	22,351	$10,505
1869	70,000	3,500	303,000	166,650	1889	6,228	4,982	26,988	13,594
1870	63,800	3,190	315,000	163,800	1890	5,799	4,639	25,129	9,549
1871	37,600	3,760	189,000	101,200	1891	5,200	3,900	20,000	9,800
1872	32,000	3,200	160,000	128,000	1892	4,800	3,360	18,196	8,006
1873	44,000	4,400	220,500	50,000	1893	7,900	6,320	21,400	9,630
1874	33,000	3,300	165,000	74,250	1894	12,313	9,850	15,100	5,534
1875	25,400	3,810	126,000	81,900	1895[a]				
1876	31,500	4,725	157,500	157,500	1896	10,000	8,000	12,444	4,604
1877	74,000	14,800	221,000	44,200	1897	41,714	31,286	8,400	3,360
1878	30,000	6,000	125,000	56,250	1898	25,700	17,990	5,111	1,845
1879	38,318	19,159	190,000	76,000	1899	22,300	16,725	6,310	2,330
1880	24,650	24,650	127,000	57,150	1900	5,969	5,969	2,200	880
1881	19,475	19,475	84,392	60,762	1901	7,000	7,000	1,200	480
1882	22,085	22,085	95,702	38,281	1902	12,491	9,993	1,800	792
1883	27,725	20,794	120,142	108,128	1903	14,100	11,985	700	280
1884	7,026	7,026	30,446	15,527	1904	8,500	6,800	1,000	400
1885	6,564	6,564	28,444	12,800	1905	11,335	8,213		
1886	3.550	3,550	15,383	5,692					
1887	6,730	5,384	29,163	16,040	Total	843,930	343,542	3,064,001	1,582,219

[a] Data missing.

Whales.—Whaling at the present time is participated in to a very limited extent by the natives of Alaska, the Eskimos living along the Arctic coast being the only ones engaged. At one time, however, the natives of the Aleutian chain and the shores of Bering Sea followed whaling whenever possible during the summer months. As from the beginning, almost all of the whaling is done by the fleet which rendezvous at San Francisco. About 1867 from 10 to 12 of these whalers visited what are known as the Kadiak grounds, but this ground was soon exhausted and the whole fleet now works exclusively in the Arctic. Large numbers of humpback whales (*Megaptera versabilis*) are to be seen during the summer months in southeast Alaska, but no effort is made to capture them. The bowhead (*Balæna mysticetus*) is the common Arctic whale, and the one generally secured by the whalers, although a few right whales (*Balæna sieboldii*) are taken in certain seasons. The principal object of whale fishing at the present time is the whalebone, which brings as much as $5 per pound in the markets. As the whaling fleet generally pursues its prey in the open sea and has its headquarters outside of Alaska, its work does not come within the scope of this report except as it deals with the natives.

The belt of open water bordering the American coast from Icy Cape to the mouth of the Colville River is a favorite resort for whales during the latter part of summer and until winter sets in. From Icy Cape to Point Barrow the coast is low and sandy and backed by shallow lagoons, its southern portion being known to whalemen as the "graveyard," owing to the great number of vessels that have been wrecked there. It is along this stretch of coast that the natives do their whaling. In April the ice pack begins to loosen, and soon there

are cracks, or "leads," as they are called, open 6 or 7 miles from the shore, extending often for miles parallel to the land, but continually changing, frequently disappearing altogether as the wind veers. It is in these "leads" of open water that the whales work their way to their unknown breeding grounds in the northeast, passing by Point Barrow chiefly during the months of May and June.

Each village fits out as many boats as it can supply with crews. The crews, 8 or 10 men to the boat, or occasionally women when men are scarce, are selected during the winter. The owner, who is always the captain and steersman, sometimes hires them outright, paying them with goods, and sometimes he allows them to share in the profits; he always feeds them while the boat is in commission. The harpooner is posted in the bow, while another man, armed with a bomb gun, is located amidships. As soon as a whale is seen the boat is launched and the pursuit begun. Instead of harpooning the whale and keeping the end of the line fast in the boat, which the whale is compelled to drag about until the crew can manage to haul up and lance him to death, as is the practice of the white whalers, the Eskimos have but a short line attached to each harpoon, to the end of which are fastened two floats made of whole sealskins inflated, which are thrown overboard as soon as the harpoon is fixed in the whale. Each boat carries four or five harpoons, and as many boats as possible crowd around and endeavor to drive a harpoon into the whale each time he comes to the surface, until he can dive no longer and lies upon the water ready for the death stroke, which is given with a lance. Occasionally an opportunity occurs to use the bomb gun as soon as the whale is struck, and the contest is then ended at once. As soon as killed, the whale is towed to the edge of the solid floe and the work of cutting him up begins. The skin, blubber, and flesh, according to a custom universal among the Eskimos, belong to the whole community, no matter who killed it, but at Point Barrow the whalebone must be equally divided among all the boats that were in sight when the whale was killed. Everything is soon carried home to the village. The blubber is not tried out, but is packed away in bags made of whole sealskins, and with the meat is stowed away in little underground chambers, of which there are many in the villages.

There is very little data showing the extent of the whaling as followed by the Eskimos. In 1891 they took from 10 to 15 whales, while in 1892—a very poor season, owing to the large quantities of ice on the eastern shore at the time the whales were passing north—about 15,000 pounds of whalebone were secured. In 1905, 8,057 pounds of bone, valued at $51,197, were taken. All of the bone secured by the natives is sold to the whaling vessels, and it is very probable that large quantities so obtained in barter are reported at the home port as part of the catch of the vessel. In 1880 it is estimated that natives

put up 5,000 gallons of whale oil, valued at $500. During the period from 1883 to 1889, both inclusive, the Alaska Commercial Company shipped 33 packages of whalebone from Alaska. The weight and value of the packages are not given. In 1882, 166 barrels and in 1889, 13 barrels of whale oil were shipped from Alaska by the same company.

GENERAL STATISTICS FOR 1905.

The fisheries of Southeast Alaska in 1905 were canvassed by the writer in person; the figures for the salmon fisheries of Central and Western Alaska are compiled from the reports sent in by the canneries and salteries to the agent at the salmon fisheries of Alaska; data for the cod and other fisheries of the same sections were secured either by personal interviews or by correspondence with the owners of fishing vessels and stations, nearly all of whom are located either in California or Washington; the yield of fur seals from the Pribilof group was obtained from the report of the agent at the fur seal islands, and of the balance of the fur seals and the other aquatic furs and skins, also the whalebone, walrus ivory, etc., from the custom-house records at Juneau, Alaska. The custom-house records show the fiscal year (1904–5); all other data in the following tables represent the calendar year 1905.

In order that the data might be shown with greater clearness, the district has been divided into four geographical sections. Southeast Alaska embraces all that narrow strip of mainland and the numerous islands adjacent, from Portland Canal northwestward to, but not including, Yakutat Bay; Central Alaska embraces everything on the Pacific, or south, side from Yakutat Bay westward, including the Aleutian chain; Western Alaska the shores of Bering Sea and islands in this sea; and Arctic Alaska, from Bering Strait to the Canadian border. As these divisions are already quite generally recognized throughout the district, their use here will not be confusing.

The number of persons employed was 11,467, of which 4,028 were engaged directly in fishing and 6,856 in the canneries, salteries, and other shore work, while 583 were employed on the transporting vessels. In the salmon fishery the employees of the cannery or saltery are usually taken to the latter place aboard a sailing vessel, which remains until the season's work is ended, when she returns to the home port with the employees and the season's pack. While lying idle during the fishing season most of the crew, not being needed aboard the ship, are employed as fishermen, and have been counted as such, thus materially reducing the number of transporters.

The total investment in the fisheries was $22,038,485, of which Western Alaska furnished more than one-half. The only fishing vessels (for herring and halibut) are those in Southeast Alaska. An important feature is the large number of transporting vessels—185—with a tonnage of 67,109 and a value of $3,112,307. Nearly all of

these vessels are employed in the salmon industry. In number gill nets lead the other forms of apparatus, but are not so effective as the traps.

In variety of products secured, Southeast Alaska leads all the other divisions. This is largely owing to its greater accessibility and to the fact that its fisheries have been worked for a much longer period than the others. The halibut, herring, and trout fisheries are confined entirely to this section. The cod fishery proper is confined to Central Alaska, only a few thousand pounds being secured incidentally in Southeast Alaska. Western Alaska leads in the value of salmon canned. The only products given for Arctic Alaska are walrus skins, whalebone, walrus ivory, and a whale's head and skull, the latter being a natural-history specimen. Owing to the inaccessibility of the greater part of Western and Arctic Alaska, practically nothing is done during the winter and early spring months, but as soon as the ice breaks up in the spring the trading vessels make their rounds of the native villages and camps and collect the skins and furs which the natives have taken during the winter and ship these to Pacific coast ports. On account of this method of handling the business, the fiscal year is the better way of showing the year's catch in this section, as one whole season thus appears, and not parts of two seasons, which would be the case were the calendar year shown. It was found an impossibility to secure anything like accurate data as to the persons employed or the investment in the business of hunting aquatic animals, as it is prosecuted in conjunction with that for land animals, such as bear, marten, mink, lynx, etc., and seems to be general among the natives. Neither has anything been shown of the fishermen and investment in the Arctic region, owing to the impossibility of securing even approximate data on such matters. The natives keep no records, and besides are in many instances migratory in their habits, thus making it an impossibility to keep track of them.

The total quantity of products secured amounted to 117,247,398 pounds, valued at $7,711,981. As it was found necessary to show in full the prepared products, the figures given represent dressed and cured weights, and not that of the products as taken from the water. There is a tremendous wastage in the Alaska fisheries, especially in that for salmon, fully one-third of the round weight of the latter fish being thrown away in the process of dressing and packing. Had the round weight for all species been shown in the table the total would have been about 155,000,000 pounds. The salmon and herring fisheries of Alaska are carried on in a somewhat different manner from that followed in other parts of the country. Owing to the lack of what might be called "resident fishermen" in the district, the canneries and guano factory have to do their own fishing, and in order to accomplish this import the necessary fishermen from the Pacific coast states each season. These men are fur-

nished with fishing gear, boats, lodging, and food throughout the season, and are paid either a certain sum per thousand for each species of salmon (the price paid varying from place to place) or else straight wages. At the end of each season the men are returned to the point from whence they sailed. On account of this procedure it has been found impossible to secure even approximately correct data as to the cost of the fish as taken from the water for the salmon canneries and the one guano factory, and their products have been shown as marketed. So far as the salted salmon and herring and other species are concerned, the data given is in the same form as shown for other sections of the country in the reports of the Bureau. The tables follow.

PERSONS EMPLOYED IN THE ALASKA FISHERIES IN 1905.

How engaged.	Southeast Alaska.	Central Alaska.	Western Alaska.	Total.
Fishermen:				
Whites	543	658	1,470	2,671
Natives	1,147	129	72	1,348
Japanese	9	.....	.....	9
Total	1,699	787	1,542	4,028
Shoresmen:				
Whites	457	329	902	1,688
Natives	512	103	374	989
Chinese	375	552	1,591	2,518
Japanese	208	208	1,215	1,631
Mexicans	.....	30	.....	30
Total	1,552	1,222	4,082	6,856
Transporters:				
Whites	187	184	202	573
Natives	10	.....	.....	10
Total	197	184	202	583
Grand total	3,448	2,193	5,826	11,467

APPARATUS AND CAPITAL ENGAGED IN THE ALASKA FISHERIES IN 1905.

Items.	Southeast Alaska.		Central Alaska.		Western Alaska.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Fishing vessels:								
Steam and other power	8	$49,775	.....	.....	.....	.....	8	$49,775
Tonnage	209	.....	.....	.....	.....	.....	209	.....
Sailing	8	5,550	.....	.....	.....	.....	8	5,550
Tonnage	81	.....	.....	.....	.....	.....	81	.....
Transporting vessels:								
Steamers and launches	59	261,450	27	$276,300	45	$1,023,357	131	1,561,107
Tonnage	1,221	.....	921	.....	3,616	.....	5,758	.....
Sailing	10	143,200	12	328,000	32	1,080,000	54	1,551,200
Tonnage	6,456	.....	14,207	.....	40,688	.....	61,351	.....
Boats	794	100,685	317	84,555	928	237,782	2,039	423,022
Apparatus, vessel fisheries:								
Purse seines	6	5,000	.....	.....	.....	.....	6	5,000
Lines	.....	2,494	.....	.....	.....	.....	.....	2,494
Apparatus, shore fisheries:								
Haul seines	57	16,075	44	21,000	.....	.....	101	37,075
Purse seines	123	44,950	1	1,000	.....	.....	124	45,950
Gill nets	197	25,050	48	2,780	909	57,577	1,154	85,407
Traps	32	164,000	23	24,000	15	19,300	70	207,300
Lines	.....	5,381	.....	10,500	.....	.....	.....	15,881
Cash capital	.....	1,842,550	.....	3,147,144	.....	7,023,506	.....	12,013,200
Shore and accessory property	.....	1,374,978	.....	1,756,404	.....	2,904,142	.....	6,035,524
Total	.....	4,041,138	.....	5,651,683	.....	12,345,664	.....	22,038,486

PRODUCTS OF THE ALASKA FISHERIES IN 1905.

Species.	Southeast Alaska.		Central Alaska.		Western Alaska.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Codfish:						
Fresh	3,200	$99				
Salted	3,650	136	5,492,000	$180,710		
Codfish roe, salted			2,060	82		
Codfish tongues, salted			7,975	432		
Halibut:						
Fresh	3,144,614	85,326				
Frozen	316,341	12,641				
Canned	16	1				
Salted	1,213,845	48,554				
Smoked	46,713	2,382				
Herring:						
Salted	1,880,700	10,331				
Smoked	24,435	1,534				
Herring guano	2,618,000	32,725				
Herring oil	1,074,150	35,805				
Salmon:						
Fresh, king	280,444	15,773				
Frozen—						
Coho	22,334	893				
Humpback	16,348	654				
King	21,643	866				
Canned—						
Coho	531,792	215,875	792,864	51,543	470,256	$31,542
Dog	1,807,980	102,207			205,776	10,849
Humpback	6,816,384	420,614	155,280	9,058	1,120,992	68,522
King	262,080	21,733	308,496	20,567	1,451,424	99,699
Sockeye	9,954,000	723,937	16,582,800	1,174,615	49,030,944	3,436,995
Salted—						
Coho	45,000	1,452	3,600	144		
Dog	7,122,160	106,320				
Humpback	346,600	10,654				
King	129,874	9,212			91,200	3,224
Sockeye	400	12			3,355,600	128,436
Smoked	17,013	1,155				
Salmon bellies, salted:						
Coho	7,000	210			3,800	285
Humpback	255,000	10,400				
King					2,700	190
Sockeye					3,600	270
Trout:						
Steelhead, frozen	12,306	738				
Other—						
Fresh	32,000	1,569				
Frozen	100	5				
Fish oil other than herring	21,413	735				
Aquatic furs and skins:						
Beaver	799	3,952	435	1,873	701	2,446
Muskrat	18	18	598	258	961	916
Otter—						
Land	1,927	7,109	1,585	3,930	1,220	3,419
Sea			300	11,867	5	2,000
Seal—						
Fur	5,028	7,138			76,368	508,945
Hair	23,688	4,512	399	139	3,267	903
Walrus ivory	90	75	129	71		
Total	38,059,085	1,897,352	23,348,521	1,455,289	55,818,814	4,298,641

PRODUCTS OF THE ALASKA FISHERIES IN 1905—Continued.

Species.	Arctic Alaska.		Total.	
	Pounds.	Value.	Pounds.	Value.
Codfish:				
Fresh			3,200	$99
Salted			5,495,650	180,846
Codfish roe, salted			2,060	82
Codfish tongues, salted			7,975	432
Halibut:				
Fresh			3,144,614	85,326
Frozen			316,341	12,641
Canned			16	1
Salted			1,213,845	48,554
Smoked			46,713	2,382
Herring:				
Salted			1,880,700	10,331
Smoked			24,435	1,534
Herring guano			2,618,000	32,725
Herring oil			[a] 1,074,150	35,805
Salmon:				
Fresh, king			280,444	15,773
Frozen—				
Coho			22,334	893
Humpback			16,348	654
King			21,643	866
Canned—				
Coho			1,794,912	298,960
Dog			2,013,756	113,056
Humpback			8,092,656	498,194
King			2,022,000	141,999
Sockeye			75,567,744	5,335,547
Salted—				
Coho			48,600	1,596
Dog			7,122,160	106,320
Humpback			346,600	10,654
King			221,074	12,436
Sockeye			3,356,000	128,448
Smoked			17,013	1,155
Salmon bellies, salted:				
Coho			10,800	495
Humpback			255,000	10,400
King			2,700	190
Sockeye			3,600	270
Trout:				
Steelhead, frozen			12,306	738
Other—				
Fresh			32,000	1,569
Frozen			100	5
Fish oil other than herring			[b] 21,413	735
Aquatic furs and skins:				
Beaver			[c] 1,935	8,271
Muskrat			[d] 1,577	1,192
Otter—				
Land			[e] 4,732	14,458
Sea			[f] 305	13,867
Seal—				
Fur			[g] 81,396	516,083
Hair			[h] 27,354	5,554
Walrus	25	$10	[i] 25	10
Walrus ivory	11,046	7,992	11,265	8,138
Whalebone	8,057	51,197	8,057	51,197
Whale's head and skull	1,850	1,500	[j] 1,850	1,500
Total	20,978	60,699	117,247,398	7,711,981

[a] Represents 143,220 gallons.
[b] Represents 2,855 gallons.
[c] Represents 1,935 skins.
[d] Represents 12,599 skins.
[e] Represents 1,889 skins.
[f] Represents 61 skins.
[g] Represents 13,566 skins.
[h] Represents 9,098 skins.
[i] Represents 1 skin.
[j] A natural-history specimen.

The following table shows in greater detail than the preceding the number of cases (together with the size and style of cans) of each species of salmon canned, and the value of same:

OUTPUT OF SALMON FROM ALASKA CANNERIES IN 1905.

Species.	Southeast Alaska.		Central Alaska.		Western Alaska.		Total.	
	Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
Coho:								
½ pound, flat	516	$1,754					516	$1,754
1 pound, flat	394	1,340					394	1,340
1 pound, tall	40,169	129,696	16,518	$51,543	9,797	$31,542	66,484	212,781
Total	41,079	132,790	16,518	51,543	9,797	31,542	67,394	215,875
Dog, or chum: 1 pound, tall	37,685	102,207			4,287	10,849	41,972	113,056
Humpback: 1 pound, tall	142,008	420,614	3,235	9,058	23,354	68,522	168,597	498,194
King:								
1 pound, flat	4,248	17,585					4,248	17,585
1 pound, tall	1,212	4,148	6,427	20,567	30,238	99,699	37,877	124,414
Total	5,460	21,733	6,427	20,567	30,238	99,699	42,125	141,999
Sockeye:								
½ pound, flat	12,915	46,674					12,915	46,674
1 pound, flat	18,725	67,410					18,725	67,410
1 pound, tall	175,735	609,853	345,575	1,174,615	1,021,478	3,436,995	1,542,788	5,221,463
Total	207,375	723,937	345,575	1,174,615	1,021,478	3,436,995	1,574,428	5,335,547
Grand total	433,607	1,401,281	371,755	1,255,783	1,089,154	3,647,607	1,894,516	6,304,671

OTHER FISHERY RESOURCES OF ALASKA.

By no means are all of the fishery resources of the district utilized even yet. The lakes, streams, and coastal waters teem with the steelhead, Dolly Varden, cutthroat, rainbow, and lake trouts, but the steelhead is the only one shipped, a small quantity being frozen each season. The lake trout (*Cristivomer namaycush*) is abundant in the Yukon River, and large quantities are caught and sold fresh in the mining towns along the river. Other fresh-water species are the common pike (*Esox lucius*); the arctic grayling (*Thymallus signifer*); seven species of white-fish (*Coregonus*), nearly all of which are important articles of food to the natives living along the rivers entering Bering Sea and the Arctic Ocean, who generally catch them with gill nets set under the ice and in traps; the inconnu (*Stenodus mackenzii*), which attains a length of 5 feet and a weight of 50 pounds; smelt (*Hypomesus olidus*), which are very abundant and used as food both fresh and dried; burbot or losh (*Lota maculatus*); sucker (*Catostomus longirostris*), and the lamprey (*Ammocœtus aureus*), of which a vast quantity is captured through the ice on the Yukon River each season by the natives and frozen for future use. The eulachon, or candlefish (*Thaleichthys pacificus*), is one of the best known of the anadromus species, but appears to be abundant in Alaskan rivers only at

infrequent periods. It has been reported at times as occurring in great abundance in the Stikine, Unuk, and Chilkat rivers, and in the rivers entering into Cook Inlet. It is much prized by the natives because of its oiliness.

In the (for Alaska) densely populated delta between the mouths of the Kuskoquim and Yukon rivers a small black-fish (*Dallia pectoralis*) is exceedingly abundant and forms the principal food of the natives during the winter months. This fish does not exceed 5 or 6 inches in length, but is very fat, and, in addition to using it whole as food, the natives try out from it a pellucid oil of which they are excessively fond.

Among the sea fishes not described elsewhere in this report and at present of commercial importance to the natives along shore or to the whites living in the vicinity of the fisheries are the following:

Atka mackerel (*Pleurogrammus monopterygius*), which are not mackerel at all, merely resembling them in flavor, are quite abundant along the southern shore of the Aleutian chain, especially around the island of Attu. They run from May to December, being most plentiful in June, July, and August, and are found in greatest abundance among the kelp in from 3 to 40 fathoms. They retire to deep water in the winter. In length the fish average about 18 inches, with an average weight of about 2½ pounds. They are an important article of food to the Aleutians, who also salt a few barrels annually which they sell to vessels calling at Dutch Harbor and Unalaska. The North American Commercial Company has experimented with these fish for some years and reports them as good food fish. In 1903 the Alaska Attu Mackerel Company was formed at Seattle, Wash., to engage in fishing for and curing this species, and during the same year put up 400 half barrels as an experiment. There is no record of any subsequent operations of the company. The fishery will doubtless be a very important one some day.

Black cod (*Anoplopoma fimbria*) and the cultus cod (*Ophiodon elongatus*) are very common in Southeastern Alaska and the Gulf of Alaska, and are excellent food fishes. The well-known redfish of Sitka (*Sebastodes melanops*) is one of several other species of rockfish found in Alaskan waters, and is exceedingly abundant in the Gulf of Alaska. Flounders seem to be abundant nearly everywhere. Sculpins, capelin, and lance, or lant, are exceedingly abundant along the shore and make excellent bait for the better species.

Along the shores of Norton Sound occurs the tomcod (*Microgadus proximus*), or wachna of the natives. This fish, which is very abundant in the fall and spring, is of immense importance to the natives, as they depend quite largely upon it for their winter's supply of food.

At first it is caught from boats anchored close to the shore, but when the new ice becomes strong enough to hold them the natives erect stakes with mats hung between to keep off the wind, and fish through holes cut in the ice. The fish are allowed to freeze, and in that condition are stored away in suitable receptacles until needed. They also form an important article of dog feed.

Throughout Southeastern Alaska clams are quite abundant. In 1898 and 1899 the North Pacific Trading and Packing Company packed each year several hundred cases of clams and clam juice, but then abandoned the business for some unknown reason. The clams were packed in September, usually, as they were then in the best condition. In 1903 the Alaska Packing and Navigation Company built a small cannery at Wrangell and put up about 20 cases that same year, but owing to lack of capital the cannery has not been operated since. In 1904, 42 cases were put up by the Alaska Fish and Halibut Company on Wrangell Narrows. There is an excellent opening in this line for experienced persons with a moderate amount of capital.

Along the Alaska peninsula and the Aleutian chain mussels, crabs, and shrimps are very abundant, and squid, octopus, and bêche-de-mer are quite numerous. All of these are at present utilized as food by the natives and a few of the whites, and large quantities are used as bait in the other fisheries. It is probable that when shipping facilities become better a trade in these products with Puget Sound ports can be built up. The natives also gather certain varieties of algæ and, after drying them, store them away to be eaten in winter.

FISHERIES CARRIED ON IN ALASKAN WATERS AND CREDITED TO PLACES OUTSIDE OF THE DISTRICT.

Cod.—In addition to the cod fisheries carried on from the shore stations there is a fleet of vessels which operate on the Alaskan banks, but as they hail from ports outside of Alaska they can not be credited to the district. The table below gives full data in regard to the operations of these vessels during 1905. Their methods of work, etc., have already been described in full elsewhere in this report.

COD FISHING CONDUCTED IN ALASKAN WATERS IN 1905 BY VESSELS FROM OUTSIDE PORTS.

Home port.	Vessels.				Lines.	Salted codfish.	
	Number.	Tonnage.	Value.	Crew.		Pounds.	Value.
San Francisco, Cal.	6	1,382	$88,380	201	$1,260	2,800,000	$85,460
Anacortes, Wash.	4	849	46,096	93	4,600	2,528,000	76,904
Seattle, Wash.	4	422	31,552	70	950	948,000	28,694
Tacoma, Wash.	1	195	8,512	24	1,200	240,000	7,320
Vancouver, British Columbia	1	.....	8,512	24	1,200	312,000	9,516
Total	16	2,848	183,052	412	9,210	6,828,000	207,894

Halibut.—The above remarks on the codfish fleet from ports outside of Alaska apply equally well to the Puget Sound fleet operating in the waters of Southeast Alaska for halibut. Full information in regard to this fleet is given elsewhere in this report. The table below shows the number of vessels engaged in the fishery and the catch, together with all other necessary data. The catch of the sail and auxiliary power vessels in Alaskan waters has been taken from the custom-house records at Juneau, but the catch of the steamers had to be estimated, as these vessels return to their home port with their catch and lump the catch taken in Alaskan waters with that obtained outside.

HALIBUT FISHING CONDUCTED IN ALASKAN WATERS IN 1905 BY VESSELS FROM OUTSIDE PORTS.

Home port.	Steamers.			Sail and auxiliary power vessels.			Crew.	Lines.	Fresh halibut.	
	Number.	Tonnage.	Value.	Number.	Tonnage.	Value.			Pounds.	Value.
Port Townsend, Wash.	.....	.....	.....	4	40	$2,710	16	$1,050	.....	.....
Seattle, Wash.	1	128	$45,600	28	503	38,340	187	13,180	.....	.....
Tacoma, Wash.	2	274	80,000	1	17	1,030	81	6,550	.....	.....
Vancouver, British Columbia.	2	130	60,000	.....	.....	.....	58	2,700	.....	.....
Total.	5	532	185,600	33	560	42,080	342	23,480	5,367,422	$161,023